STIC Search Report
EIC 1700

STIC Database Tracking Number: 209647

TO:	From:
Michael Bernshteyn Location: Remsen 10a34 Art Unit : 1713 December 7, 2006 Phone: 571-272-2411 Serial Number: 10 / 523373	Jan Delaval Location: EIC 1700 Remsen 4a30 Phone: 571-272-2504 jan.delaval@uspto.gov

Search Notes

Access DB# 20967

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Michael Bernshteyn Examiner # : 81575 Date: 12/06/06
Art Unit: 1713 Phone Number 30 272-2411 Serial Number: 10/523,373
Mail Box and Bldg/Room Location: Rm. 10A24 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: 08/02/2002

For Sequence Searches Only *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

claims 34 and 36 concerning proton-conducting polymer membrane.

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STAFF USE ONLY

Searcher: _____

Searcher Phone #: _____

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Date Searcher Picked Up: 12/6/06

Date Completed: 12/9/06

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Type of Search

NA Sequence (#) _____

AA Sequence (#) _____

Structure (#) ✓

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Other (specify) _____

PTO-1590 (8-01)

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STRUCTURE FILE UPDATES:    5 DEC 2006  HIGHEST RN 914910-45-5
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=> d sta que l15
L8                SCR 1812 OR 1758
L9                STR

C===C
1   2


NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   2

STEREO ATTRIBUTES: NONE
L11       180184 SEA FILE=REGISTRY SSS FUL L8 AND L9
L12              STR

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4 S--O
  ||  5
  O
  7


NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   4
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STEREO ATTRIBUTES: NONE
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SEARCH TIME: 00.00.01

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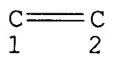
L9 STR



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STEREO ATTRIBUTES: NONE
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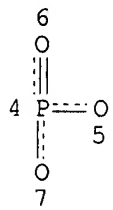

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GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 4

STEREO ATTRIBUTES: NONE
L16 66420 SEA FILE=REGISTRY SUB=L11 SSS FUL L13

100.0% PROCESSED 71763 ITERATIONS 66420 ANSWERS
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L1 STR
L2 50 S L1

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L3           2 S US20050244695/PN OR (US2005-523373# OR WO2003-EP8462 OR DE200
L4        4634 S PROTON?(L)CONDUCT?(L)?MEMBRAN?
L5        2333 S L4 AND ?POLYM?
L6        2117 S L4 AND POLYM?/SC,SX,CW,CT,BI
L7        2363 S L5,L6

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L8              SCR 1812 OR 1758
L9              STR
L10          50 S L9 AND L8 SAM
L11      180184 S L8 AND L9 FUL
L12             STR L1
L13             STR L12
L14          50 S L12 SAM SUB=L11
L15      109126 S L12 FUL SUB=L11
L16       66420 S L13 FUL SUB=L11

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L17       60343 S L16
L18       75669 S L15
L19         200 S L7 AND L17,L18
L20         232 S L4 AND L17,L18
L21         232 S L19,L20
L22         122 S L21 AND PROTON?(2A)CONDUCT?(2A)?MEMBRAN?
L23         110 S L21 NOT L22
L24          14 S L22 AND PY<=2002 NOT P/DT
L25          36 S L23 AND PY<=2002 NOT P/DT
L26          36 S L22 AND (PD<=20020802 OR PRD<=20020802 OR AD<=20020802)
L27          49 S L23 AND (PD<=20020802 OR PRD<=20020802 OR AD<=20020802)
L28          85 S L24-L27
                SEL RN L3

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L29          27 S E1-E27
L30           0 S L29 AND L11

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                E FUEL CELL/CT
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L32        2384 S E24
L33       42398 S E13-E32
                E E13+ALL
L34       48788 S E6+OLD,NT
                E E23+ALL
L35       23596 S E8+OLD
L36          44 S L28 AND L31-L35
                SEL HIT RN

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L37          60 S E1-E60
                SEL RN 17 32 34 51 53 54 56 59 60
L38           9 S E61-E69
                SEL RN L37 15 16 18 21-24 28 31 35 37 44 55 57
L39          14 S E70-E83

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L41         790 S L40 AND  PY<=2002 NOT P/DT
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L44          15 S L43 AND L7
L45          13 S L43 AND PROTON?(2A)CONDUCT?(2A)?MEMBRAN?
L46          26 S L43 AND L31-L35
L47          13 S L44,L45 AND L46
L48          15 S L44,L45,L47
L49          13 S L46 NOT L48
L50           2 S L49 AND PROTON? AND CONDUCT?
L51           8 S L49 AND MEMBRAN?
L52          10 S L49 AND ?POLYM?
L53           9 S L52 AND L50,L51
L54           9 S L50,L53
L55           1 S L51,L52 NOT L54
L56          24 S L54,L48
L57          17 S L56 AND PROTON?
L58          23 S L56 AND CONDUCT?
L59          23 S L56 AND ?MEMBRAN?
L60          24 S L56 AND ?POLYM?
L61          17 S L57 AND L58,L59
L62           7 S L58,L59 NOT L61

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FILE LAST UPDATED: 5 Dec 2006  (20061205/ED)

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=> d 161 bib abs hitind hitstr retable tot

L61  ANSWER 1 OF 17  HCAPLUS  COPYRIGHT 2006 ACS on STN
AN   2004:32956  HCAPLUS
DN   140:96868
TI   Phosphate and/or sulfonate group containing solid polymer
     electrolyte (composite ) membrane and fuel cell using the
     membrane
IN   Rikukawa, Masahiro; Kanzaki, Yoshio; Ito, Koreatsu; Kanzaki, Munehiro
PA   Uni Chemical K. K., Japan
SO   Jpn. Kokai Tokkyo Koho, 30 pp.
```

CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

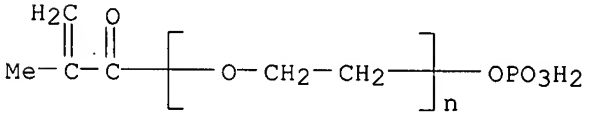
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004014232	A2	20040115	JP 2002-164577	20020605 <--
PRAI JP 2002-164577		20020605 <--		

AB The electrolyte **membrane** has a uniform composition comprising: a -PO4 group containing **polymer** by **polymerizing** a -PO4 group containing unsatd. monomer having ≥1 -PO4 group inside the mol. and ≥1 unsatd. ethylene bond; a -SO3 and -PO4 group containing **copolymer** by **copolymg**. the PO4 group containing unsatd. monomer and a -SO3 group containing unsatd. monomer having ≥1 -SO3 group inside the mol. and ≥1 unsatd. ethylene bond; ≥1 -SO3 group containing **polymer** by **polymerizing** a -SO3 group containing unsatd. monomer; and a polyamide resin. The electrolyte composite **membrane** having **proton conductivity** and is made of the above uniform composition and a reinforced sheet.

IC ICM H01B0001-06
ICS B01D0069-12; B01D0071-40; B01D0071-56; B01D0071-82; C08F0030-02; C08F0290-06; C08J0005-22; C08L0041-00; C08L0043-02; C08L0077-00; H01M0008-02; H01M0008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel cell electrolyte **membrane** phosphated sulfonated **polymer**
IT **Fuel cells**
Polymer electrolytes
(**polymer electrolyte membranes** containing phosphate and/or sulfonate groups for fuel cells)
IT Polyamides, uses
RL: DEV (Device component use); USES (Uses)
(**polymer** electrolyte **membranes** containing phosphate and/or sulfonate groups for fuel cells)
IT 24599-21-1 25087-26-7, Methacrylic acid **homopolymer** 25267-41-8D, sulfonated 51131-63-6 **151653-09-7** 163549-93-7 519140-46-6
RL: DEV (Device component use); USES (Uses)
(**polymer** electrolyte **membranes** containing phosphate and/or sulfonate groups for fuel cells)
IT **151653-09-7**
RL: DEV (Device component use); USES (Uses)
(**polymer** electrolyte **membranes** containing phosphate and/or sulfonate groups for fuel cells)
RN 151653-09-7 HCAPLUS
CN Poly(oxy-1,2-ethanediyl), α-(2-methyl-1-oxo-2-propenyl)-ω-(phosphonooxy)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 35705-94-3
CMF (C2 H4 O)n C4 H7 O5 P
CCI PMS



L61 ANSWER 2 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:913467 HCAPLUS
DN 139:384023
TI Method of preparation of **polymer** electrolyte **membrane** for fuel cells
IN Kiefer, Joachim; Uensal, Oemer
PA Celanese Ventures GmbH, Germany
SO PCT Int. Appl., 48 pp.
CODEN: PIXXD2
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003096465	A1	20031120	WO 2003-EP4914	20030512 <--
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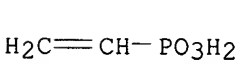
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
	DE 10220818	A1	20031120	DE 2002-10220818	20020510 <--
	CA 2485564	AA	20031120	CA 2003-2485564	20030512 <--
	EP 1506591	A1	20050216	EP 2003-727465	20030512 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
	CN 1653640	A	20050810	CN 2003-810598	20030512 <--
	JP 2005525683	T2	20050825	JP 2004-504331	20030512 <--
	US 2006166067	A1	20060727	US 2004-513895	20041208 <--
PRAI	DE 2002-10220818	A	20020510 <--		
	WO 2003-EP4914	W	20030512		

AB The invention relates to a **proton-conducting** **polymer** electrolyte **membrane** which is based on polyvinylphosphonic acid/polyvinylsulfonic acid **polymers** and can be used for a variety of purposes due to the excellent chemical and thermal properties thereof. The inventive **membrane** is particularly suitable as a **polymer** electrolyte **membrane** in PEM fuel cells.
IC ICM H01M0008-10
ICS C08J0005-22; B01D0071-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **polymer** electrolyte **membrane** fuel cell
IT **Fuel cell electrolytes**
(method of preparation of **polymer** electrolyte **membrane** for fuel cells)
IT **Fuel cells**
(**solid electrolyte**; method of preparation of **polymer electrolyte membrane** for fuel cells)
IT **110161-68-7DP**, Vinylphosphonic acid-vinylsulfonic acid **copolymer**, derivs.
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(method of preparation of **polymer** electrolyte **membrane** for fuel cells)
IT **110161-68-7DP**, Vinylphosphonic acid-vinylsulfonic acid **copolymer**, derivs.
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(method of preparation of **polymer** electrolyte **membrane**

for fuel cells)
RN 110161-68-7 HCAPLUS
CN Ethenesulfonic acid, polymer with ethenylphosphonic acid (9CI) (CA INDEX NAME)

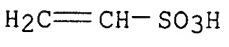
CM 1

CRN 1746-03-8
CMF C2 H5 O3 P



CM 2

CRN 1184-84-5
CMF C2 H4 O3 S



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Buechi, F	1997			US 5656386 A	HCAPLUS
D Agostino, V	1977			US 4012303 A	HCAPLUS

L61 ANSWER 3 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:913466 HCAPLUS
DN 139:367613
TI **Proton-conducting** graft **copolymers** of vinylphosphonic acid derivatives and vinylsulfonic acid derivatives as fuel cell separators
IN Kiefer, Joachim; Uensal, Oemer
PA Celanese Ventures G.m.b.H., Germany; Pemeas GmbH
SO PCT Int. Appl., 44 pp.
CODEN: PIXXD2
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003096464	A2	20031120	WO 2003-EP4913	20030512 <--
	WO 2003096464	A3	20041104		
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	DE 10220817	A1	20031127	DE 2002-10220817	20020510 <--
	CA 2485507	AA	20031120	CA 2003-2485507	20030512 <--
	EP 1512190	A2	20050309	EP 2003-732344	20030512 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
	US 2005175879	A1	20050811	US 2003-513949	20030512 <--
	JP 2005525682	T2	20050825	JP 2004-504330	20030512 <--
	CN 1729588	A	20060201	CN 2003-810605	20030512 <--
PRAI	DE 2002-10220817	A	20020510 <--		

WO 2003-EP4913 W 20030512

AB **Proton-conducting polymer** electrolyte **membranes** for fuel cells are based on monomers and **polymers** of vinylphosphonic acid monomers and vinylsulfonic acid monomers, which are **polymerized** by radical **polymerization** and then cast as a flat **membrane** and then dried. The vinylphosphonic acid monomers and **polymers** have general structures: (1) (CH2=CH)y-R-(PO3Z2)x, (2) CH2=C[-R-(PO3Z2)x]2, and (3) CH2=C(A)-R-(PO3Z2)x; the vinylsulfonic acid monomers and **polymers** have similar structures, in which the PO3Z2 groups are replaced with SO3Z groups. In these structures, R = C1-15-alkylene or oxyalkylene, ethyleneoxy, or C5-20-arylene; Z = H, C1-15-alkyl or alkoxy, hydroxyethyl, or C5-20-aryl; x = 1-10, yr = 1-10; and A = CO2R2, CN, CONR22, OR2, or R2 (R2 = H, C1-15-alkyl or alkoxy, hydroxyethylene, or C5-20-aryl). The inventive **membrane** is particularly suitable as a **polymer** electrolyte **membrane** (PEM) in PEM fuel cells.

IC ICM H01M0008-10
ICS B01D0071-28; B01D0067-00; B01D0071-32; B01D0071-78; B01D0069-12; B01D0069-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST **proton conducting** vinylphosphonic vinylsulfonic acid **polymer** fuel cell; **polymer** electrolyte fuel cell \
vinylphosphonic vinylsulfonic acid

IT **Polymerization**
(graft, radical; **proton-conducting** graft **copolymers** of vinylphosphonic acid derivs. and vinylsulfonic acid derivs. as fuel cell separators)

IT Polyelectrolytes
(**membranes**; **proton-conducting** graft **copolymers** of vinylphosphonic acid derivs. and vinylsulfonic acid derivs. as fuel cell separators)

IT Vinyl compounds, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**polymers**, phosphonic acid and vinylsulfonic acid group-containing; **proton-conducting** graft **copolymers** of vinylphosphonic acid derivs. and vinylsulfonic acid derivs. as fuel cell separators)

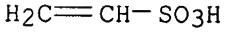
IT **Fuel cell separators**
(**proton-conducting** graft **copolymers** of vinylphosphonic acid derivs. and vinylsulfonic acid derivs. as fuel cell separators)

IT Sulfonic acids, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(vinyl, **polymers** with vinylphosphonic acid derivs., **membranes**; **proton-conducting** graft **copolymers** of vinylphosphonic acid derivs. and vinylsulfonic acid derivs. as fuel cell separators)

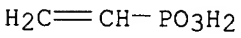
IT **1184-84-5D**, Vinylsulfonic acid, derivs., **polymer** with vinylphosphonic acids **1746-03-8D**, Vinylphosphonic acid, derivs., **polymer** with vinylsulfonic acids 13598-36-2D, Phosphonic acid, vinyl derivs., **polymers** with vinylsulfonic acid derivs.
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**membranes**; **proton-conducting** graft **copolymers** of vinylphosphonic acid derivs. and vinylsulfonic acid derivs. as fuel cell separators)

IT **1184-84-5D**, Vinylsulfonic acid, derivs., **polymer** with

vinylphosphonic acids **1746-03-8D**, Vinylphosphonic acid, derivs., **polymer** with vinylsulfonic acids
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**membranes**; **proton-conducting** graft **copolymers** of vinylphosphonic acid derivs. and vinylsulfonic acid derivs. as fuel cell separators)
RN 1184-84-5 HCAPLUS
CN Ethenesulfonic acid (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 1746-03-8 HCAPLUS
CN Phosphonic acid, ethenyl- (9CI) (CA INDEX NAME)



L61 ANSWER 4 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:719776 HCAPLUS
DN 139:248019
TI Mixture comprising vinyl-containing phosphonic acid and **polymer** electrolyte **membranes** comprising polyvinylphosphonic acid for use in fuel cells
IN Uensal, Oemer; Kiefer, Joachim; Christ, Gunter
PA Celanese Ventures G.m.b.H., Germany
SO PCT Int. Appl., 56 pp.
CODEN: PIXXD2
DT Patent
LA German
FAN.CNT 1

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	DE 10213540	A1	20040219	DE 2002-10213540	20020306 <--
	CA 2478252	AA	20030912	CA 2003-2478252	20030304 <--
	EP 1488473	A1	20041222	EP 2003-743391	20030304 <--
	EP 1488473	B1	20051026		
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	CN 1639901	A	20050713	CN 2003-805310	20030304 <--
	JP 2005527075	T2	20050908	JP 2003-573730	20030304 <--
	AT 308123	E	20051115	AT 2003-743391	20030304 <--
PRAI	DE 2002-10213540	A	20020306	<--	
	WO 2003-EP2398	W	20030304		

AB The invention relates to a **proton conducting polymer membrane** based on polyvinylphosphonic acid obtained by means of a method comprising the following steps: (A) mixing a **polymer** with phosphonic acid containing vinyl, (B) forming a flat structure by using the inventive mixture from step (A) on a support, (C) **polymerization** of the vinylphosphonic acid present in the flat structure according to step (B). The inventive **membrane** can be used in a

variety of ways on account of the excellent chemical and thermal properties thereof and is particularly suitable for use as a **polymer** -electrolyte-**membrane** (PEM) in PEM-fuel cells.

IC ICM H01M0008-10
ICS C08J0005-22

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST fuel cell **polymer** electrolyte **membrane**
polyvinylphosphonic acid

IT Electric **conductivity**
Fuel cell electrolytes
Membranes, nonbiological
(mixture comprising vinyl-containing phosphonic acid and **polymer** electrolyte **membranes** comprising polyvinylphosphonic acid for use in fuel cells)

IT Polybenzimidazoles
RL: DEV (Device component use); USES (Uses)
(mixture comprising vinyl-containing phosphonic acid and **polymer** electrolyte **membranes** comprising polyvinylphosphonic acid for use in fuel cells)

IT **Polymerization**
(radiochem.; mixture comprising vinyl-containing phosphonic acid and **polymer** electrolyte **membranes** comprising polyvinylphosphonic acid for use in fuel cells)

IT **Fuel cells**
(**solid electrolyte**; mixture comprising vinyl-containing phosphonic acid and **polymer electrolyte membranes** comprising polyvinylphosphonic acid for use in fuel cells)

IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(support; mixture comprising vinyl-containing phosphonic acid and **polymer** electrolyte **membranes** comprising polyvinylphosphonic acid for use in fuel cells)

IT **27754-99-0**, Phosphonic acid, ethenyl-, **homopolymer**
RL: DEV (Device component use); USES (Uses)
(mixture comprising vinyl-containing phosphonic acid and **polymer** electrolyte **membranes** comprising polyvinylphosphonic acid for use in fuel cells)

IT 25038-59-9, Polyethylene terephthalate, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(support; mixture comprising vinyl-containing phosphonic acid and **polymer** electrolyte **membranes** comprising polyvinylphosphonic acid for use in fuel cells)

IT **27754-99-0**, Phosphonic acid, ethenyl-, **homopolymer**
RL: DEV (Device component use); USES (Uses)
(mixture comprising vinyl-containing phosphonic acid and **polymer** electrolyte **membranes** comprising polyvinylphosphonic acid for use in fuel cells)

RN 27754-99-0 HCAPLUS
CN Phosphonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P

$H_2C{=}CH{-}PO_3H_2$

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Daimler Benz Ag	1998			EP 0846733 A	HCAPLUS
Eduard, D	1965			US 3224908 A	
Ernst, W	1966			US 3293088 A	
Formato, R	2001			US 6248469 B1	HCAPLUS

L61 ANSWER 5 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:719543 HCAPLUS
DN 139:248013
TI Manufacture of **proton-conducting** fuel cell electrolyte **membrane** having reduced methanol permeability
IN Kiefer, Joachim; Uensal, Oemer; Calundann, Gordon; Crivello, James
PA Celanese Ventures GmbH, Germany
SO PCT Int. Appl., 58 pp.
CODEN: PIXXD2
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003074597	A1	20030912	WO 2003-EP2397	20030304 <--
	W: BR, CA, CN, JP, KR, MX, US				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
	DE 10209685	A1	20030918	DE 2002-10209685	20020306 <--
	DE 10210499	A1	20030925	DE 2002-10210499	20020311 <--
	CA 2478530	AA	20030912	CA 2003-2478530	20030304 <--
	EP 1483316	A1	20041208	EP 2003-743390	20030304 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
	US 2005118477	A1	20050602	US 2003-506387	20030304 <--
	JP 2005519428	T2	20050630	JP 2003-573059	20030304 <--
	CN 1639239	A	20050713	CN 2003-805300	20030304 <--
PRAI	DE 2002-10209685	A	20020306 <--		
	DE 2002-10210499	A	20020311 <--		
	WO 2003-EP2397	W	20030304		

AB A title **membrane** was manufactured by (A) swelling a **polymer** film with a liquid comprising vinylsulfonic acid and (B) **polymerization** of the vinylsulfonic acid present in the liquid used in step (A). For example, heating aqueous solution containing vinylsulfonic acid (obtained by acidification of Na vinylsulfonate with acidic ion exchanger) and vinylphosphonic acid for 1 h at 70°, adding CN-120 (epoxy acrylate) and Irgacure 184, heating the solution for 30 min at 70°, immersing a polybenzimidazole film in the mixture and heating for 3 h at 80°, placing the resulting film between transparent polypropylene (PP) films, irradiating both sides of the laminate and separating PP films gave a title **membrane**. The typical weight gain of the **membrane** was 350%.
IC ICM C08J0007-16
ICS H01M0008-10; C08J0005-22
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **35**, 38
ST polyvinylsulfonic acid polybenzimidazole film **proton conducting** electrolyte **membrane** manuf; polybenzimidazole film vinylsulfonic vinylphosphonic acid **polymn** fuel cell **membrane**; **proton conducting membrane**

manuf vinylsulfonic acid epoxy acrylate **polymer**

IT Polybenzimidazoles
RL: TEM (Technical or engineered material use); USES (Uses)
(films; manufacture of vinylsulfonic acid **copolymer proton -conducting** fuel cell electrolyte **membrane**)

IT **Fuel cell electrolytes**
Fuel cell separators
(manufacture of vinylsulfonic acid **copolymer proton-conducting** fuel cell electrolyte **membrane**)

IT **596130-67-5P**, CN 120-Vinylphosphonic acid-Vinylsulfonic acid **copolymer** 596130-68-6P, CN 120-Styrenesulfonic acid-Vinylphosphonic acid **copolymer**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**membrane**; manufacture of vinylsulfonic acid **copolymer proton-conducting** fuel cell electrolyte **membrane**)

IT **596130-67-5P**, CN 120-Vinylphosphonic acid-Vinylsulfonic acid **copolymer**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**membrane**; manufacture of vinylsulfonic acid **copolymer proton-conducting** fuel cell electrolyte **membrane**)

RN 596130-67-5 HCAPLUS

CN Phosphonic acid, ethenyl-, polymer with CN 120 and ethenesulfonic acid (9CI) (CA INDEX NAME)

CM 1

CRN 163206-65-3
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 1746-03-8
CMF C2 H5 O3 P

$H_2C{=}CH{-}PO_3H_2$

CM 3

CRN 1184-84-5
CMF C2 H4 O3 S

$H_2C{=}CH{-}SO_3H$

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1978	002	C-026	PATENT ABSTRACTS OF	

Hans-Joerg, J	2000			US 6096369 A	HCAPLUS
Huels Chemische Werke A	1999			EP 0893165 A	HCAPLUS
Klein, E	1980			US 4187333 A	HCAPLUS
Nakao, S	2000			WO 0054351 A	HCAPLUS
Nakao, S	2000			EP 1202365	HCAPLUS
Toyo Soda Mfg Co Ltd	1978			JP 53097988 A	HCAPLUS

L61 ANSWER 6 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:719542 HCAPLUS
DN 139:248012
TI Manufacture of **proton-conducting** electrolyte **membrane** for use at high temperatures and in fuel cells
IN Uensal, Oemer; Kiefer, Joachim
PA Celanese Ventures GmbH, Germany
SO PCT Int. Appl., 59 pp.
CODEN: PIXXD2
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003074596	A1	20030912	WO 2003-EP2399	20030304 <--
	W: BR, CA, CN, JP, KR, MX, US				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
	DE 10209419	A1	20030925	DE 2002-10209419	20020305 <--
	CA 2477864	AA	20030912	CA 2003-2477864	20030304 <--
	EP 1483314	A1	20041208	EP 2003-711950	20030304 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
	US 2005084727	A1	20050421	US 2003-506880	20030304 <--
	CN 1649944	A	20050803	CN 2003-810121	20030304 <--
	JP 2005527073	T2	20050908	JP 2003-573058	20030304 <--
PRAI	DE 2002-10209419	A	20020305 <--		
	WO 2003-EP2399	W	20030304		

AB A title **membrane** is manufactured by (A) swelling a **polymer** film with a liquid containing a vinylphosphonic acid, and (B) **polymerizing** the vinylphosphonic acid present in the liquid introduced in step (A). For example, soaking a polybenzimidazole film for 1.5-2.5 h at 80° in a solution containing 1 part H2O and 10 parts 97% vinylphosphonic acid, soaking the swollen film in a solution containing 10 parts vinylphosphonic acid and 1 part aqueous solution containing 0.1% 2,2'-azobis(isobutyramidine)·2HCl and heating the film for 1 h at 80° gave a title **membrane** having **conductivity** 15.3 mS/cm (160°).
IC ICM C08J0005-22
ICS C08K0005-5317
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **35**, 38
ST **proton conducting** electrolyte **membrane** manuf vinylphosphonic acid **polymer**; polybenzimidazole film vinylphosphonic acid **polymn** fuel cell **membrane** manuf; polyvinylphosphonic acid polybenzimidazole film **proton conducting** electrolyte **membrane** manuf
IT **Membranes**, nonbiological
(elec. **conductive**; manufacture of **proton-conducting** electrolyte **membrane** for use at high temps. and in fuel cells)
IT Polybenzimidazoles
RL: TEM (Technical or engineered material use); USES (Uses)

(films; manufacture of **proton-conducting** electrolyte **membrane** for use at high temps. and in fuel cells)

IT **Fuel cell separators**
(manufacture of **proton-conducting** electrolyte **membrane** for use at high temps. and as)

IT 161035-26-3P, N,N'-Methylenebisacrylamide-Vinylphosphonic acid **copolymer**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(crosslinked, **membrane**; manufacture of **proton-conducting** electrolyte **membrane** for use at high temps. and in fuel cells)

IT **27754-99-0P**, Vinylphosphonic acid **polymer**
596044-62-1P, CN 120-Vinylphosphonic acid **copolymer**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**membrane**; manufacture of **proton-conducting** electrolyte **membrane** for use at high temps. and in fuel cells)

IT **27754-99-0P**, Vinylphosphonic acid **polymer**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**membrane**; manufacture of **proton-conducting** electrolyte **membrane** for use at high temps. and in fuel cells)

RN 27754-99-0 HCAPLUS
CN Phosphonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Andreola, C	1997			US 5643968 A	HCAPLUS
Yu, M	2001			US 2001038937 A1	HCAPLUS

L61 ANSWER 7 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:719541 HCAPLUS
DN 139:231745
TI Manufacture of **proton-conducting polymer membranes** for fuel cells from mixtures of **polymers** with vinylsulfonic acid monomers
IN Kiefer, Joachim; Uensal, Oemer
PA Celanese Ventures GmbH, Germany
SO PCT Int. Appl., 57 pp.
CODEN: PIXXD2
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003074595	A1	20030912	WO 2003-EP2395	20030304 <--

W: BR, CA, CN, JP, KR, MX, US
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR

DE 10209684	A1	20030925	DE 2002-10209684	20020306	<--
DE 10210500	A1	20031009	DE 2002-10210500	20020311	<--
CA 2477863	AA	20030912	CA 2003-2477863	20030304	<--
EP 1485427	A1	20041215	EP 2003-711948	20030304	<--
EP 1485427	B1	20060118			

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK

US 2005118478	A1	20050602	US 2003-506622	20030304	<--
CN 1649945	A	20050803	CN 2003-810165	20030304	<--
JP 2005526875	T2	20050908	JP 2003-573057	20030304	<--
AT 316111	E	20060215	AT 2003-711948	20030304	<--
PRAI DE 2002-10209684	A	20020306	<--		
DE 2002-10210500	A	20020311	<--		
WO 2003-EP2395	W	20030304			

AB A **proton-conducting polymer membrane** based on poly(vinylsulfonic acid), useful especially as a **polymer** -electrolyte-**membrane** (PEM) in PEM-fuel cells, is manufactured by (A) mixing a **polymer** with vinylsulfonic acid monomer, (B) forming a planar structure by using the mixture from step (A) on a support, and (C) **polymerizing** the vinylsulfonic acid monomer in the planar structure prepared in step (B). A title **membrane** was prepared by treating polybenzimidazole (PBI) with H3PO4 for 4 h at 160°, neutralizing and washing the PBI with H2O, drying, dissolving the PBI in vinylphosphonic acid, adding aqueous vinylsulfonic acid solution (preparation from Na vinylsulfonate given), casting a film on a PET polyester substrate and irradiating with electron beam.

IC ICM C08J0005-22
ICS B01D0007-00; H01M0008-02

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): **35**, 76

ST polybenzimidazole vinylsulfonic vinylphosphonic acid **copolymn** **proton conducting membrane** manuf; interpenetrating network polybenzimidazole vinylsulfonic vinylphosphonic acid **copolymer** electrolyte **membrane**; fuel cell **membrane** polybenzimidazole vinylsulfonic vinylphosphonic acid **copolymer** manuf; electron beam **polymn** vinylsulfonic vinylphosphonic acid fuel cell **membrane**

IT **Membranes**, nonbiological
(**conductive**; manufacture of **proton-conducting polymer membranes** for fuel cells from mixts. of **polymers** with vinylsulfonic acid monomers)

IT **Membranes**, nonbiological
(elec. **conductive**; manufacture of **proton-conducting polymer membranes** for fuel cells from mixts. of **polymers** with vinylsulfonic acid monomers)

IT **Fuel cell separators**
Fuel cells
(manufacture of **proton-conducting polymer membranes** for fuel cells from mixts. of **polymers** with vinylsulfonic acid monomers)

IT Polybenzimidazoles
RL: TEM (Technical or engineered material use); USES (Uses)
(**membranes**; manufacture of **proton-conducting polymer membranes** for fuel cells from mixts. of **polymers** with vinylsulfonic acid monomers)

IT **110161-68-7P**, Vinylphosphonic acid-Vinylsulfonic acid

copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(interpenetrating network with polybenzimidazole, **membrane**; manufacture of **proton-conducting polymer** **membranes** for fuel cells from mixts. of **polymers** with vinylsulfonic acid monomers)

IT **110161-68-7P**, Vinylphosphonic acid-Vinylsulfonic acid **copolymer**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(interpenetrating network with polybenzimidazole, **membrane**; manufacture of **proton-conducting polymer** **membranes** for fuel cells from mixts. of **polymers** with vinylsulfonic acid monomers)

RN 110161-68-7 HCAPLUS
CN Ethenesulfonic acid, polymer with ethenylphosphonic acid (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P

$H_2C{=}CH{-}PO_3H_2$

CM 2

CRN 1184-84-5
CMF C2 H4 O3 S

$H_2C{=}CH{-}SO_3H$

RETABLE

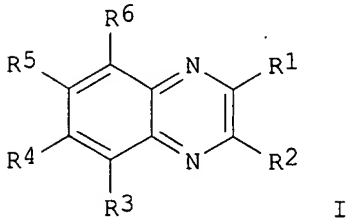
Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Formato, R	1999			WO 9910165 A	HCAPLUS
Fuglevand, W	2000			US 6030718 A	HCAPLUS
Gregor, H	1974			US 3808305 A	HCAPLUS
Hashimoto, K	1973			US 3737045 A	HCAPLUS
Sheikh-Ali, B	2000			US 6110616 A	HCAPLUS

L61 ANSWER 8 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:675704 HCAPLUS
DN 139:220846
TI **Proton conductive polymer** solid electrolyte, manufacture of the electrolyte, the electrolyte film, manufacture thereof, electrochemical element using the same, and manufacture of electrochemical element
IN Takeuchi, Masataka
PA Showa Denko K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 45 pp.
CODEN: JKXXAF
DT Patent

LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003242833	A2	20030829	JP 2002-41375	20020219 <--
PRAI	JP 2002-41375		20020219 <--		

GI



I

AB The **proton conductive polymer** solid electrolyte comprises and oxide compound and a **polymer** containing quinoxaline structures, one of which is represented by I (R1-6 = ≥1 of them is group linking to backbone chain of **polymer**, and others are halo, H, nitro, carboxylic acid, etc.). The process comprises mixing a **polymer** containing a quinoxaline and an oxide compound The electrochem. element may include batteries, fuel cells, double-layer capacitors, and electrochromic element. The use of the quinoxaline structure in the electrolyte film provided higher strength and reliability.

IC ICM H01B0001-06
ICS C08G0061-12; C08K0003-00; C08K0005-00; C08L0065-00; C08L0101-02; H01B0013-00; H01G0009-025; H01M0008-02; H01M0008-10; H01M0010-40

CC 72-3 (Electrochemistry)
Section cross-reference(s): 35, 38, 52

ST **proton conductive polymer** solid electrolyte quinoxaline structure; fuel cell battery capacitor electrochromic element

IT Capacitors
(double layer; **proton conductive polymer** solid electrolyte film for)

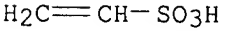
IT Polyphosphoric acids
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of **proton conductive polymer** solid electrolyte film for electrochem. element)

IT Polyquinoxalines
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyether-, polyphenylquinoxaline-; manufacture of **proton conductive polymer** solid electrolyte film for electrochem. element)

IT Polyquinoxalines
RL: DEV (Device component use); USES (Uses)
(polyphenylquinoxalines; manufacture of **proton conductive polymer** solid electrolyte film for electrochem. element)

IT Polyethers, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyquinoxaline-, polyphenylquinoxaline-; manufacture of **proton conductive polymer** solid electrolyte film for electrochem. element)

IT **Fuel cells**
Secondary batteries
(**proton conductive polymer solid electrolyte** film for)
IT **1184-84-5DP**, Vinylsulfonic acid, reaction product with **polymethoxyphenylquinoxaline** ether 25568-77-8DP, reaction products with sulfuric acid 25656-52-4DP, reaction products with p-styrenesulfonic acid 37196-91-1DP, reaction products with p-styrenesulfonic acid 52232-62-9DP, reaction products with sulfuric acid 503606-43-7DP, reaction products with vinylsulfonic acid 503606-47-1DP, reaction products with vinylsulfonic acid
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(manufacture of **proton conductive polymer** solid electrolyte film for electrochem. element)
IT 91-95-2, [1,1'-Biphenyl]-3,3',4,4'-tetramine 98-70-4D, p-Styrenesulfonic acid, reaction product with polyphenylquinoxaline ether 2676-59-7, 3,3'-4,4'-Tetraaminodiphenyl ether 3363-97-1 7664-93-9D, Sulfuric acid, reaction product with polyphenylquinoxaline 50851-57-5D, Polystyrenesulfonic acid, reaction product with polyphenylquinoxaline 64380-47-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of **proton conductive polymer** solid electrolyte film for electrochem. element)
IT **1184-84-5DP**, Vinylsulfonic acid, reaction product with **polymethoxyphenylquinoxaline** ether
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(manufacture of **proton conductive polymer** solid electrolyte film for electrochem. element)
RN 1184-84-5 HCAPLUS
CN Ethenesulfonic acid (6CI, 8CI, 9CI) (CA INDEX NAME)



L61 ANSWER 9 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:628405 HCAPLUS
DN 139:166954
TI **Proton-conductive polymer membrane** and its use in fuel cell
IN Kuromatsu, Hidehisa; Minamimura, Kiyoyuki
PA Kanegafuchi Chemical Industry Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

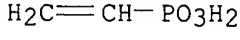
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2003229143	A2	20030815	JP 2002-29044	20020206 <--
PRAI JP 2002-29044		20020206 <--		

AB The **membrane** contains **polymers** having SO3H-containing aromatic rings and has P content 0.001-5%. The **membrane** has high **proton conductivity** and oxidation resistance and is useful for an electrolyte in a solid **polymer** fuel cell.
IC ICM H01M0008-02
ICS C08J0005-22; C08K0003-32; C08L0043-02; C08L0081-04; C08L0101-02;

H01M0008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76
ST fuel cell electrolyte **proton conductive polymer membrane**
IT Polysulfones, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, aromatic, sulfonated; **proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
IT Polyethers, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polysulfone-, aromatic, sulfonated; **proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
IT **Fuel cell electrolytes**
(**proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
IT Ionic **conductors**
(**protonic**; **proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
IT Polythiophenylenes
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfonated; **proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
IT 9016-75-5DP, Poly(phenylene sulfide), sulfonated
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(Torelina; **proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
IT 1343-93-7 **27754-99-0**, Poly(vinylphosphonic acid)
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(**membrane** containing; **proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
IT 25667-42-9DP, sulfonated
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
IT **27754-99-0**, Poly(vinylphosphonic acid)
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(**membrane** containing; **proton-conductive** sulfo-containing aromatic ring **polymer membrane** for fuel cell electrolyte with high oxidation resistance)
RN 27754-99-0 HCAPLUS
CN Phosphonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P



L61 ANSWER 10 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:550635 HCAPLUS
DN 139:119902
TI **Polymer** electrolyte fuel cells employing **conducting** redox **polymers** as electrode catalysts
IN Abe, Masao; Ishibashi, Kuniaki
PA Nitto Denko Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2003203641	A2	20030718	JP 2001-401949	20011228 <--
PRAI JP 2001-401949		20011228 <--		

AB The fuel cell employs a **conducting** redox **polymer** as an electrode catalyst, and a **proton**-exchange electrolyte **membrane** made of a hydrocarbon **polymer** having (hetero atom-containing framework and) acid groups. The fuel cell shows high electromotive force and high discharge d., and can be economically manufactured by employing the hydrocarbyl **polymer** electrolytes.

IC ICM H01M0004-90
ICS H01M0004-92; H01M0008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 67, 76
ST fuel cell electrode redox catalyst **conducting polymer**; doped **conducting polymer** redox catalyst fuel cell electrode; sulfonated **polymer** fuel cell **proton** exchange electrolyte; polyaniline **conductive polymer** fuel cell electrode catalyst; polypyridine **conductive polymer** fuel cell electrode catalyst; polyindole **conductive polymer** fuel cell electrode catalyst; Polyphenylquinoxaline **conductive polymer** fuel cell electrode catalyst
IT **Fuel cell electrodes**
(**conducting polymer** redox catalysts in; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)
IT Redox reaction catalysts
(**conducting polymers**; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)
IT Phenolic resins, uses
RL: CAT (Catalyst use); DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(novolak, phenolsulfonic acid-based, dopant, in **conducting** redox **polymers**; **polymer** electrolyte fuel cells

containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT Doping
(of **conducting** redox **polymer**; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT **Fuel cell electrolytes**
(**polymer**; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT Polyquinoxalines
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(polyphenylquinoxalines, redox catalysts in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT Polyanilines
RL: CAT (Catalyst use); DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polyvinylsulfonic acid-doped, redox catalysts in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT **Conducting polymers**
(redox catalysts, in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT **Fuel cells**
(**solid electrolyte**, **polymer electrolyte**; **polymer electrolyte** fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT Polybenzimidazoles
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(sulfonated, **proton**-exchange electrolytes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT **26101-52-0**, Polyvinylsulfonic acid 50973-35-8, Formaldehyde-phenolsulfonic acid **copolymer**
RL: CAT (Catalyst use); DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(dopant, in polyaniline redox catalysts in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT 7664-93-9, Sulfuric acid, uses
RL: CAT (Catalyst use); DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(dopant, in polyindole redox catalysts in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT 82451-55-6P, Polyindole
RL: CAT (Catalyst use); DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(doped, redox catalysts in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT 25233-30-1P, Polyaniline
RL: CAT (Catalyst use); DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polyvinylsulfonic acid-doped, redox catalysts in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT 9003-31-0DP, Polyisoprene, sulfonated 9003-70-7DP, Divinylbenzene-styrene **copolymer**, sulfonated 76067-46-4P
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(**proton**-exchange electrolytes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

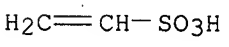
IT 25013-01-8, Polypyridine
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(redox catalysts in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

IT **26101-52-0**, Polyvinylsulfonic acid
RL: CAT (Catalyst use); DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(dopant, in polyaniline redox catalysts in electrodes; **polymer** electrolyte fuel cells containing **conducting** redox **polymer** as electrode catalyst and **proton**-exchange electrolyte made of hydrocarbyl **polymer** having acid groups)

RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S



L61 ANSWER 11 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2002:216383 HCAPLUS
DN 136:234757
TI Electrolyte **membrane**, fuel cell, and manufacture of the **membrane** and the cell
IN Yamaguchi, Takeo; Nakao, Shinichi
PA Foundation for Scientific Technology Promotion, Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002083612	A2	20020322	JP 2000-272203	20000907 <--
PRAI	JP 2000-272203		20000907 <--		

AB The electrolyte **membrane** has a H **conductive** **polymer** filled in the pores of a MeOH- and H2O-non-swellable porous substrate. The **membrane** is prepared by bonding a 1st **polymer** with its 1 end to the pores of a porous substrate, swell resistant to organic solvent or water, and bonding a 2nd **polymer** to the other end of the 1st **polymer**; where the 2 **polymers** are the same or different but are both H **conductive**. The fuel cell has the electrolyte **membrane** between a cathode and an anode, and is prepared by forming a 1st electrode from a sol, forming a porous film on the electrode, forming an electrolyte **membrane** by the above method using the porous film, and applying a 2nd electrode on the electrolyte **membrane**.

IC ICM H01M0008-02
ICS C08J0009-40; H01M0008-10; C08L0027-18; C08L0079-08

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST fuel cell **proton conducting polymer** electrolyte **membrane** manuf

IT **Fuel cell electrolytes**
(structure and manufacture of **proton conducting** **polymer** grafted in porous Teflon **membranes** for fuel cell electrolytes)

IT **Fluoropolymers**, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(structure and manufacture of **proton conducting** **polymer** grafted in porous Teflon **membranes** for fuel cell electrolytes)

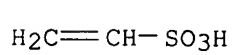
IT 9002-84-0, Teflon
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(structure and manufacture of **proton conducting** **polymer** grafted in porous Teflon **membranes** for fuel cell electrolytes)

IT 79-10-7, Acrylic acid, uses **1184-84-5**, Vinylsulfonic acid
RL: MOA (Modifier or additive use); USES (Uses)
(structure and manufacture of **proton conducting** **polymer** grafted in porous Teflon **membranes** for fuel cell electrolytes)

IT **1184-84-5**, Vinylsulfonic acid
RL: MOA (Modifier or additive use); USES (Uses)
(structure and manufacture of **proton conducting** **polymer** grafted in porous Teflon **membranes** for fuel cell electrolytes)

RN 1184-84-5 HCAPLUS

CN Ethenesulfonic acid (6CI, 8CI, 9CI) (CA INDEX NAME)



L61 ANSWER 12 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:404576 HCAPLUS

DN 131:104489

TI Electronically **conducting** **proton** exchange

polymers as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation

AU Lefebvre, Mark C.; Qi, Zhigang; Pickup, Peter G.
CS Department of Chemistry, Memorial University of Newfoundland, St. John's, NF, A1B 3X7, Can.

SO Journal of the Electrochemical Society (**1999**), 146(6), 2054-2058
CODEN: JESOAN; ISSN: 0013-4651
PB Electrochemical Society
DT Journal
LA English

AB A variety of supported catalysts were prepared by the chemical deposition of Pt and Pt-Ru particles on chemical prepared poly(3,4-ethylenedioxythiophene)/poly(styrene-4-sulfonate) (PEDOT/PSS) and PEDOT/polyvinylsulfate (PVS) composites. The **polymer** particles were designed to provide a porous, **proton-conducting** and electron-**conducting** catalyst support for use in fuel cells. These **polymer**-supported catalysts were characterized by electron microscopy, impedance spectroscopy, cyclic voltammetry, and **cond**. measurements. Their catalytic activities toward hydrogen and methanol oxidation and oxygen reduction were evaluated in **proton** exchange **membrane** fuel-cell-type gas diffusion electrodes. Activities for oxygen reduction comparable to that obtained with a com. carbon-supported catalyst were observed, whereas those for hydrogen and methanol oxidation were significantly inferior, although still high for prototype catalysts.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST fuel cell electrocatalysis **polymer** catalyst support; oxygen redn **polymer** catalyst support; hydrogen oxidn **polymer** catalyst support; methanol oxidn **polymer** catalyst support

IT Oxidation catalysts
Reduction catalysts
(electrochem.; electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

IT **Conducting polymers**
Fuel cells
Oxidation, electrochemical
Reduction, electrochemical
(electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** **exchange membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(fluorine-containing, sulfo-containing, ionomers; electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

IT **Fluoropolymers**, uses
Fluoropolymers, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

IT Ionomers
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

IT 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses
RL: CAT (Catalyst use); USES (Uses)
(electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

IT **25191-25-7**, Polyvinylsulfate 28210-41-5, Poly(styrene-4-sulfonic acid) 66796-30-3, Nafion 117 126213-51-2, Poly(3,4-ethylenedioxythiophene)
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

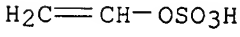
IT 67-56-1, Methanol, reactions 1333-74-0, Hydrogen, reactions 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

IT **25191-25-7**, Polyvinylsulfate
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(electronically **conducting proton** exchange **polymers** as catalyst supports for **proton** exchange **membrane** fuel cells electrocatalysis of oxygen reduction, hydrogen oxidation, and methanol oxidation)

RN 25191-25-7 HCAPLUS
CN Sulfuric acid, monoethenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 13401-80-4
CMF C2 H4 O4 S



RETABLE

Referenced Author	Year	VOL	PG	Referenced Work	Referenced

(RAU)	(RPY)	(RVL)	(RPG)	(RWK)	File
Albery, W	1994		443	Electroactive Polyme	HCAPLUS
Appleby, A	1996	354	1681	Philos Trans R Soc L	HCAPLUS
Biegler, T	1971	29	269	J Electroanal Chem	HCAPLUS
Hamnett, A	1990	94	1014	Ber Bunsenges Phys C	HCAPLUS
Klug, H	1974			X-Ray Diffraction Pr	
Lefebvre, M	1999	11	262	Chem Mater	HCAPLUS
Parthasarathy, A	1992	339	101	J Electroanal Chem	HCAPLUS
Qi, Z	1998		15	Chem Commun	HCAPLUS
Qi, Z	1998		2299	Chem Commun	HCAPLUS
Qi, Z	1997	9	2934	Chem Mater	HCAPLUS
Qi, Z	1998	459	9	J Electroanal Chem	HCAPLUS
Watanabe, M	1987	229	395	J Electroanal Chem	HCAPLUS

L61 ANSWER 13 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1997:552546 HCAPLUS
DN 127:151018
TI Nonliquid **proton conductors** for use in electrochemical systems under ambient conditions
IN Fleischer, Niles A.; Manassen, Joost; Daren, Steve
PA E.C.R.-Electro-Chemical Research Ltd., Israel
SO U.S., 10 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 5643689	A	19970701	US 1996-697835	19960828 <--
US 5741611	A	19980421	US 1997-805414	19970226 <--
IL 121405	A1	20000629	IL 1997-121405	19970727 <--
EP 827228	A1	19980304	EP 1997-650029	19970729 <--
EP 827228	B1	20000329		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
CA 2212677	AA	19980228	CA 1997-2212677	19970811 <--
AU 9734284	A1	19990304	AU 1997-34284	19970819 <--
AU 717377	B2	20000323		
JP 10162846	A2	19980619	JP 1997-232298	19970828 <--
PRAI US 1996-697835	A3	19960828 <--		

AB A nonliq. **proton conductor membrane** includes a matrix **polymer** dissolvable in a 1st solvent and an acidic multimer dissolvable in the 1st solvent, wherein, the matrix **polymer** is selected such that when the nonliq. **proton conductor membrane** is contacted with a 2nd solvent, the nonliq. **proton conductor membrane** swells and improves the elec. contact between the anode and cathode plates of an electrochem. system. The electrochem. system comprises an anode plate, a cathode plate, and a nonliq. **proton conductor membrane** interposed between the anode plate and cathode plate, such that an elec. contact is formed between the anode plate and cathode plate via the nonliq. **proton conductor membrane** and ions flow the plates.
IC ICM H01M0006-18
ICS H01M0008-10
INCL 429033000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
ST nonliq **proton conductor** electrochem system; fuel cell

nonliq **proton conductor**; battery nonliq **proton conductor**; elec capacitor nonliq **proton conductor**; electrolytic cell nonliq **proton conductor**

IT Polyolefins
RL: MOA (Modifier or additive use); USES (Uses)
(filler in nonliquid **proton conductors** for use in electrochem. systems under ambient conditions)

IT Paraffin waxes, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in preparation of nonliquid **proton conductors** for use in electrochem. systems under ambient conditions)

IT Electric **conductors**
(nonliq. **proton**; for use in electrochem. systems under ambient conditions)

IT Capacitors
Electrolytic cells
Fuel cells
Primary batteries
Secondary batteries
(nonliquid **proton conductors** for use in electrochem. systems under ambient conditions)

IT 1306-38-3, Ceria, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 9003-53-6, Polystyrene 13463-67-7, Titania, uses
RL: MOA (Modifier or additive use); USES (Uses)
(filler in nonliquid **proton conductors** for use in electrochem. systems under ambient conditions)

IT 9002-89-5, Poly(vinyl alcohol) 11119-67-8, Dowex 50W-X8
25053-27-4, Sodium polyvinyl sulfonate
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in preparation of nonliquid **proton conductors** for use in electrochem. systems under ambient conditions)

IT **25053-27-4**, Sodium polyvinyl sulfonate
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in preparation of nonliquid **proton conductors** for use in electrochem. systems under ambient conditions)

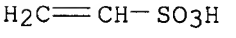
RN 25053-27-4 HCAPLUS
CN Ethenesulfonic acid, homopolymer, sodium salt (9CI) (CA INDEX NAME)

CM 1

CRN 26101-52-0
CMF (C2 H4 O3 S)x
CCI PMS

CM 2

CRN 1184-84-5
CMF C2 H4 O3 S



L61 ANSWER 14 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1989:442849 HCAPLUS

DN 111:42849
TI Hydrogen separation and electricity generation using novel electrolyte **membranes**
IN Polak, Anthony J.; Petty-Weeks, Sandra
PA Allied-Signal, Inc., USA
SO U.S., 12 pp. Cont. of U. S. Ser. No. 756,889, abandoned.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4797185	A	19890110	US 1987-70620	19870706 <--
PRAI	US 1984-687351	A2	19841228 <--		
	US 1985-756889	A1	19850719 <--		

AB An apparatus for performing an electrochem. process involving a gaseous mixture having a component which, in the presence of a catalytic agent, is capable of dissociating to yield H ions or of combining with H ions, comprises a thin-film macroscopically homogeneous **polymer** blend **membrane**, a **membrane** housing comprising a 1st and a 2nd gas chamber separated by the **membrane**, 2 sep. portions of catalytic agent effective to promote the dissociation and combination, and means for forming an elec. connection in operative contact with the catalytic agent. The apparatus comprises also means to supply fuel gas to 1 and oxidant gas to the other of the 2 chambers, or to supply the gaseous mixture to 1 and remove H from the other chamber. The **membrane** possessing a high **protonic conductivity** and formed by removing the solvent from a solution of a phosphoric acid and a **polymer** contains .apprx.10-70% H2PO3, HPO3, H3PO4, H4P2O7, and polyphosphoric acid and .apprx.30-90% **polymer** such as poly(vinyl alc.), poly(vinyl fluoride), polyethylene glycol, etc. In 1 version, the **membrane** may be formed into a hollow fiber having elec. **conductive** particles with catalyst embedded in the fiber walls; a multiplicity of such fibers may be used to form a H separation device.

IC ICM C25B0001-02
ICS C25B0009-00
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 72
ST hydrogen sepn acid **polymer membrane**; fuel cell acid **polymer membrane**; phosphoric acid **polymer membrane cond**; **cond protonic** acid **polymer membrane**
IT Polyimides, uses and miscellaneous
RL: USES (Uses)
(**membranes** from blends containing phosphorus acids and, for fuel cells and hydrogen separation)
IT Polyphosphoric acids
RL: USES (Uses)
(**membranes** from blends containing **polymer** and, for fuel cells and hydrogen separation)
IT Dissociation catalysts
(palladium and platinum, fuel cells containing **membranes** from phosphorus acid-**polymer** blends and, for separation of hydrogen from gaseous mixts.)
IT **Fuel cells**
(**separators**, phosphorus acid-**polymer** blends)
IT 7440-05-3, Palladium, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous 11107-69-0
RL: CAT (Catalyst use); USES (Uses)

(catalysts, fuel cells containing **membranes** from phosphorus acid-**polymer** blends and, for separation of hydrogen from gaseous mixts.)

IT 9002-89-5, Poly(vinyl alcohol) 9002-98-6, Polyethylenimine 9003-01-4, Poly(acrylic acid) 9003-05-8, Poly(acrylamide) 9003-43-4, Poly(vinyl pyrrolidine) 9003-47-8, Poly(vinyl pyridine) 9004-35-7, Cellulose acetate 24981-14-4, Poly(vinyl fluoride) 25189-55-3, Poly(N-isopropyl acrylamide) 25322-68-3, Poly(ethylene glycol) 25805-17-8, Poly(ethyloxazoline) **26101-52-0**, Poly(vinyl sulfonic acid) 26793-34-0, Poly(N,N-dimethyl acrylamide) 26913-06-4, Polyethylenimine
RL: USES (Uses)
(**membranes** from blends containing phosphorus acids and, for fuel cells and hydrogen separation)

IT 2466-09-3, Pyrophosphoric acid 7664-38-2, Phosphoric acid, uses and miscellaneous 7664-93-9, Sulfuric acid, uses and miscellaneous 7803-60-3, Hypophosphoric acid 10343-62-1, Metaphosphoric acid
RL: USES (Uses)
(**membranes** from blends containing **polymer** and, for fuel cells and hydrogen separation)

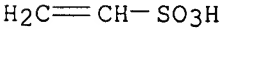
IT 1333-74-0P, Hydrogen, preparation
RL: PREP (Preparation)
(separation of, **membranes** from phosphorus acid-**polymer** blends for)

IT **26101-52-0**, Poly(vinyl sulfonic acid)
RL: USES (Uses)
(**membranes** from blends containing phosphorus acids and, for fuel cells and hydrogen separation)

RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S



L61 ANSWER 15 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1988:188070 HCAPLUS
DN 108:188070
TI Water-insoluble **proton-conducting membranes**
IN Zupancic, Joseph J.; Swedo, Raymond J.; Petty-Weeks, Sandra
PA UOP Inc., USA
SO U.S., 7 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 4708981	A	19871124	US 1985-807727	19851211 <--
PRAI US 1985-807727		19851211 <--		

AB Title **membranes**, useful for gas separating and sensing, comprise interpenetrating networks of a host composition containing H2SO4 or H3PO4 and **polymers** from unsatd. compds., ethylene oxide, ethylenimine, or phenol-HCHO mixts., and a guest **polymer** formed from a monofunctional acrylic monomer different from that of the host **polymer** and difunctional acrylic crosslinking agents. Thus,

solns. of 0.5 g poly(vinyl alc.) and 0.2 mL 85% H3PO4, and 2 g methylenebisacrylamide and 30.1 g methacrylic acid were prepared in 25 mL boiling water and water, resp. Mixing 6.7 mL and 10 mL of each solution, pouring into a polycarbonate Petridish, drying and irradiating with electron beam gave a **membrane**. Cutting the **membrane** into disk, sputter-depositing Pt electrodes on both sides of the disk, assembling this **membrane** onto a Teflon holder, and connecting with electricity through Cu platens while maintaining 1 atmospheric H pressure on 1 side and exposing the other side to a mixture of 10% H and 90% N for 24 h showed an output electromotive force (EMF) 29.2 mV and resistivity 2.0 + 106 Ω-cm. This was compared to an output EMF 0.1 mV when 100% H was present on both sides of the **membrane**.

IC ICM C08L0029-04
ICS C08L0033-02; C08L0041-00; C08L0043-02

INCL 525059000

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 72

ST **membrane** gas sepn; sensor gas **membrane**; hydrogen sensor **membrane**; permselective **membrane proton conducting polymer**; electrolyte thin film gas sepn; polyvinyl alc **membrane** gas sensor; phosphoric acid **membrane** gas sensor; acrylamide **polymer membrane** gas sensor

IT Plastics, film
RL: USES (Uses)
(interpenetrating **polymer** blend, acid-containing, water-insol. **proton conducting**, for gas separating and sensing)

IT **Membranes**
(permselective, for gas separating and sensing, interpenetrating **polymer** blends for, water-insol., **proton-conducting**)

IT 7664-38-2, uses and miscellaneous 7664-93-9, uses and miscellaneous
RL: USES (Uses)
(**membranes** containing, interpenetrating-**polymer** blend-based, **proton-conducting** water-insol., for gas separating and sensing)

IT 25034-58-6 30280-72-9, Acrylic acid-methylenebisacrylamide **copolymer** 30421-16-0, Methacrylic acid-methylenebisacrylamide **copolymer** 114239-64-4, N,N-Diallylacrylamide-methacrylic acid **copolymer**
RL: USES (Uses)
(permselective **membrane** composites containing acid-modified **polymer** and, water-insol., **proton-conducting**, for gas separating and sensing)

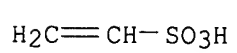
IT 9002-89-5, Poly(vinyl alcohol) 9002-98-6 9003-01-4, Poly(acrylic acid) 9003-05-8, Poly(acrylamide) 9003-35-4, Formaldehyde-phenol **copolymer** 25014-15-7, Poly(2-vinylpyridine) 25087-26-7, Poly(methacrylic acid) 25232-41-1, Poly(4-vinylpyridine) 25232-42-2, Poly(N-vinylimidazole) 25322-68-3, Poly(ethylene oxide) 25805-17-8, Poly(2-ethyl-2-oxazoline) **26101-52-0**, Poly(vinyl sulfonic acid)
RL: USES (Uses)
(permselective **membrane** composites containing crosslinked **polymers** and acid-modified, water-insol. and **proton-conducting**, for gas separating and sensing)

IT **26101-52-0**, Poly(vinyl sulfonic acid)
RL: USES (Uses)
(permselective **membrane** composites containing crosslinked **polymers** and acid-modified, water-insol. and **proton-conducting**, for gas separating and sensing)

RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S



L61 ANSWER 16 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1987:469924 HCAPLUS
DN 107:69924
TI Method and apparatus for gas detection using **proton-conducting polymers**
IN Zupancic, Joseph J.; Swedo, Raymond J.; Petty-Weeks, Sandra L.
PA UOP Inc., USA
SO U.S., 13 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

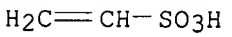
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 4664757	A	19870512	US 1985-814345	19851227 <--
PRAI US 1985-814345		19851227 <--		

AB An apparatus and method are described for detecting and measuring H and gaseous compds. capable of dissociating into or combining with H ions using a solid electrolyte concentration cell. A novel **proton-conducting membrane** comprised of an interpenetrating **polymer** network serves as the solid electrolyte. A reference gas or a solid substance is used. For increased strength, the **membrane** may be composited with or utilized with a porous support.
IC ICM G01N0027-58
INCL 204-1T
CC 79-2 (Inorganic Analytical Chemistry)
ST **proton conducting polymer** gas detection app
IT **Polymers, uses and miscellaneous**
RL: USES (Uses)
(**proton-conducting**, in gas sensors)
IT Gas analysis
Hydrocarbons, analysis
RL: ANST (Analytical study)
(sensor for, **proton-conducting polymer**)
IT 7440-02-0, Nickel, uses and miscellaneous 7440-05-3, Palladium, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(catalyst, in **proton-conducting polymer** gas sensor)
IT 7647-01-0, Hydrochloric acid, analysis
RL: ANT (Analyte); ANST (Analytical study)
(detection of, **proton-conducting polymer** gas sensor for)
IT 1333-74-0, Hydrogen, analysis 7782-44-7, Oxygen, analysis
RL: ANT (Analyte); ANST (Analytical study)
(determination of, in gases, **proton-conducting polymer** sensor for)

IT 12648-42-9, Palladium hydride
RL: ANST (Analytical study)
(in **proton-conducting polymer** gas sensor)
IT 79-41-4, Methacrylic acid, uses and miscellaneous 110-26-9, Methylenebisacrylamide 7664-38-2, Phosphoric acid, uses and miscellaneous 9002-89-5, Polyvinyl alcohol 9002-98-6 9003-01-4, Poly(acrylic acid) 9003-05-8, Poly(acrylamide) 9003-05-8D, Poly(acrylamide), derivs. 25014-15-7, Poly(2-vinylpyridine) 25087-26-7, Poly(methacrylic acid) 25232-41-1, Poly(4-vinylpyridine) 25232-42-2, Poly(N-vinylimidazole) 25322-68-3, Poly(ethylene oxide) 25805-17-8, Poly(2-ethyl-2-oxazoline) **26101-52-0**, Poly(vinyl sulfonic acid)
RL: DEV (Device component use); USES (Uses)
(**membrane** containing, for **proton-conducting polymer** gas sensor)
IT **26101-52-0**, Poly(vinyl sulfonic acid)
RL: DEV (Device component use); USES (Uses)
(**membrane** containing, for **proton-conducting polymer** gas sensor)
RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S



L61 ANSWER 17 OF 17 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1987:462049 HCAPLUS
DN 107:62049
TI Electrochemical method and apparatus using **proton-conducting polymers**
IN Zupancic, Joseph J.; Swedo, Raymond J.; Petty-Weeks, Sandra L.
PA UOP Inc., USA
SO U.S., 10 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 4664761	A	19870512	US 1985-814339	19851227 <--
PRAI US 1985-814339		19851227 <--		

AB An interpenetrating **polymer**-network **membrane** for use as solid electrolyte in fuel cells or separation of H from gas mixture or other electrochem. processes involving H+ contains a host **polymer** blend of H3PO4 or H2SO4 mixed with a **polymer** or **copolymer** of ethyleneimine, acrylic acid, ethylene oxide, 2-ethyl-2-oxazoline, acrylamide, N-substituted acrylamide, 4-vinylpyridine, methacrylic acid, N-vinylimidazole, vinylsulfonic acid, 2-vinylpyridine, poly(hydroxyethylene), or PhOH-HCHO resin and a guest **polymer** of acrylic acid, methacrylic acid, acrylamide, methacrylamide, 2-acrylamido-2-methylpropanesulfonic acid, N-benzylacrylamide, N-ethylmethylacrylamide, N-phenylacrylamide, or N-phenylmethacrylamide crosslinked by methylenebisacrylamide,

N,N-diallylacryllamide, m-xylenebisacrylamide, or N,N'-trimethylenebisacrylamide where the repeating units of the guest **polymer** is different from that of the host **polymer.** The **membrane** is coated with catalysts on opposite sides and used as partitioner to sep. 2 gas chambers in an apparatus An aqueous solution of H3PO4 and poly(vinyl alc.) and an aqueous solution of methylenebisacrylamide and methacrylic acid were mixed, poured into a Petri dish, H2O was evaporated, the film was irradiated by a 175-keV electron beam at 5 Mrad/pass from 1 side, cut into a 1"-diameter disk, and sputtered to form 400-Å Pt layers on both sides. This disk had a resistivity of 2 + 106 Ω-cm and a H flux of 1.8 + 10-5 ft3/ft2-h.

IC ICM C25B0001-02
ICS H01M0008-10
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 47, 49, 72
ST polyvinyl alc phosphoric acid electrolyte; **polymethacrylic** acid solid electrolyte; fuel cell **polymer** solid electrolyte; hydrogen sepn **polymer** solid electrolyte
IT **Fuel cells**
(**electrolytes** for, solid **polymer**)
IT 30421-16-0, Methacrylic acid-methylenebisacrylamide **copolymer**
RL: USES (Uses)
(crosslinked, solid electrolytes containing, **proton-conductive**, for fuel cells and other electrochem. apparatus)
IT 1333-74-0P, Hydrogen, preparation
RL: PREP (Preparation)
(separation of, from gas mixts. by electrochem. processes, solid **polymer** electrolytes for)
IT 7664-38-2, Phosphoric acid, uses and miscellaneous 7664-93-9, Sulfuric acid, uses and miscellaneous 9002-89-5 9002-98-6 9003-01-4, Poly(acrylic acid) 9003-05-8 9003-35-4, Formaldehyde phenol **copolymer** 25014-15-7, Poly(2-vinylpyridine) 25087-26-7, Poly(methacrylic acid) 25232-41-1, Poly(4-vinylpyridine) 25232-42-2, Poly(N-vinylimidazole) 25322-68-3, Poly(ethylene oxide) 25805-17-8, Poly(2-ethyl-2-oxazoline) **26101-52-0**, Poly(vinyl sulfonic acid)
RL: USES (Uses)
(solid electrolytes containing, **proton-conductive**, for fuel cells and other electrochem. app)
IT **26101-52-0**, Poly(vinyl sulfonic acid)
RL: USES (Uses)
(solid electrolytes containing, **proton-conductive**, for fuel cells and other electrochem. app)
RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S

$H_2C{=}CH{-}SO_3H$

=> d 162 bib abs hitind hitstr retable tot

L62 ANSWER 1 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:123117 HCAPLUS
DN 142:222572
TI Composite solid **polymer** electrolyte **membranes** for use in electrochemical applications
IN Ofer, David; Nair, Bindu R.; Stoler, Emily J.; Kovar, Robert F.
PA Foster-Miller Inc., USA
SO U.S. Pat. Appl. Publ., 32 pp., Cont.-in-part of U.S. Ser. No. 750,402.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005031925	A1	20050210	US 2004-851478	20040522 <--
	US 2002045085	A1	20020418	US 2000-750402	20001228 <--
	US 7052793	B2	20060530		
	WO 2006073474	A2	20060713	WO 2005-US18105	20050520

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRAI	US 1999-261397	A3	19990303	<--
	US 2000-750402	A2	20001228	<--
	US 1997-57233P	P	19970829	<--
	US 1999-261349	A3	19990303	<--
	US 2004-851478	A	20040522	

AB The present invention relates to composite solid **polymer** electrolyte **membranes** (SPEMs) which include a porous **polymer** substrate interpenetrated with a water soluble ion-**conducting** material. SPEMs of the present invention are useful in electrochem. applications, including fuel cells and electrodialysis.
IC ICM H01M0008-10
ICS H01M0008-00; H01M0006-18
INCL 429030000; 429033000; 429314000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
ST **polymer** electrolyte **membrane** use electrochem application; fuel cell **polymer** electrolyte **membrane**; electrodialysis **polymer** electrolyte **membrane**
IT Polyamide fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(aramid; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT **Polymers**, uses
RL: DEV (Device component use); USES (Uses)
(aromatic, ion **conductive**; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT Polyamides, uses
Polyketones
Polysulfones, uses
RL: DEV (Device component use); USES (Uses)

(aromatic, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications).

IT Polyimides, uses
RL: DEV (Device component use); USES (Uses)
(carboxylated and phosphonated and sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Electrochemical cells
Fuel cell electrolytes
Polymer electrolytes
Sulfonation
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Polybenzoxazoles
RL: DEV (Device component use); USES (Uses)
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Polybenzimidazoles
RL: TEM (Technical or engineered material use); USES (Uses)
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Polybenzothiazoles
RL: TEM (Technical or engineered material use); USES (Uses)
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Dialyzers
(electrodialyzers, **membranes**; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Ionomers
RL: DEV (Device component use); USES (Uses)
(**fluoropolymers**; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT **Fluoropolymers**, uses
RL: DEV (Device component use); USES (Uses)
(ionomers; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Liquid crystals, **polymeric**
(lyotropic; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Ionomers
RL: DEV (Device component use); USES (Uses)
(partially fluorinated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Synthetic **polymeric** fibers, uses
RL: DEV (Device component use); USES (Uses)
(polybenzazole, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Polysulfones, uses
RL: DEV (Device component use); USES (Uses)
(polyether-, aromatic, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Polyketones
Polysulfones, uses
RL: DEV (Device component use); USES (Uses)
(polyether-, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT Polyethers, uses
RL: DEV (Device component use); USES (Uses)
(polyketone-, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT Sulfonic acids, uses
RL: DEV (Device component use); USES (Uses)
(**polymers**, fluoro; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT **Fluoropolymers**, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT Polysulfones, uses
RL: DEV (Device component use); USES (Uses)
(polyphenyl-, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT Polyquinoxalines
RL: DEV (Device component use); USES (Uses)
(polyphenylquinoxalines, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT Polyethers, uses
RL: DEV (Device component use); USES (Uses)
(polysulfone-, aromatic, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT Polyethers, uses
Polyphenyls
RL: DEV (Device component use); USES (Uses)
(polysulfone-, sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT **Polymers**, uses
RL: DEV (Device component use); USES (Uses)
(sulfo-containing, fluoro; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT Polyoxyphenylenes
Polysulfones, uses
RL: DEV (Device component use); USES (Uses)
(sulfonated; composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT 9003-01-4, Polyacrylic acid **26101-52-0**, Polyvinyl sulfonic acid **27754-99-0**, Polyvinyl phosphonic acid 50851-57-5, Polystyrene sulfonic acid 63496-24-2, Nafion EW 1100
RL: DEV (Device component use); USES (Uses)
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT 686768-99-0P 843614-17-5P
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT 3177-22-8P 25135-51-7P 25667-42-9DP, Ultrason E, sulfonated 154281-38-6DP, Radel R, sulfonated 220998-11-8P
RL: SPN (Synthetic preparation); PREP (Preparation)
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)

IT 25035-37-4, Poly(1,4-phenyleneterephthalamide)
RL: TEM (Technical or engineered material use); USES (Uses)
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
IT **26101-52-0**, Polyvinyl sulfonic acid **27754-99-0**, Polyvinyl phosphonic acid
RL: DEV (Device component use); USES (Uses)
(composite solid **polymer** electrolyte **membranes** for use in electrochem. applications)
RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S

$H_2C{=}CH{-}SO_3H$

RN 27754-99-0 HCAPLUS
CN Phosphonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P

$H_2C{=}CH{-}PO_3H_2$

L62 ANSWER 2 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:32736 HCAPLUS
DN 138:340874
TI Modified **membranes** for fuel cells
AU Florjanczyk, Zbigniew; Wielgus-Barry, Edyta; Poltarzewski, Zbigniew
CS Fac. of Chem., Warsaw Univ. of Technol., Warsaw, 00-664, Pol.
SO Zeszyty Naukowe Politechniki Slaskiej, Chemia (**2001**), 146, 227-230
CODEN: ZNSCAM; ISSN: 0372-9494
PB Wydawnictwo Politechniki Slaskiej
DT Journal
LA English
AB Nafion **membranes** modified with vinylphosphonic acid and 2-acrylamido-2-methyl-1-propanesulfonic acid **polymers** have been obtained and characterized. The main goal of this report is to describe the performance of this type of **membrane** in methanol fuel cells in comparison with an unmodified Nafion **membrane**. The results obtained are also discussed in terms of the **conducting** and swelling properties.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST methanol fuel cell modified Nafion **membrane**
IT Polyoxyalkylenes, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(fluorine- and sulfo-containing, ionomers; vinylphosphonic acid and 2-acrylamido-2-methyl-1-propanesulfonic acid **polymers**

modified Nafion **membranes** for fuel cells)

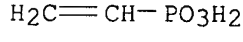
IT **Fluoropolymers**, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(polyoxyalkylene-, sulfo-containing, ionomers; vinylphosphonic acid and 2-acrylamido-2-methyl-1-propanesulfonic acid **polymers** modified Nafion **membranes** for fuel cells)

IT **Fuel cell separators**
(vinylphosphonic acid and 2-acrylamido-2-methyl-1-propanesulfonic acid **polymers** modified Nafion **membranes** for fuel cells)

IT 67-56-1, Methanol, processes **1746-03-8**, Vinylphosphonic acid 15214-89-8, 2-Acrylamido-2-methyl-1-propanesulfonic acid
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(vinylphosphonic acid and 2-acrylamido-2-methyl-1-propanesulfonic acid **polymers** modified Nafion **membranes** for fuel cells)

IT **1746-03-8**, Vinylphosphonic acid
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(vinylphosphonic acid and 2-acrylamido-2-methyl-1-propanesulfonic acid **polymers** modified Nafion **membranes** for fuel cells)

RN 1746-03-8 HCAPLUS
CN Phosphonic acid, ethenyl- (9CI) (CA INDEX NAME)



RETABLE

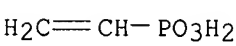
Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Forsythe, J	2000		101	Prog Polym Sci	
Prater, K	1996		105	J Power Sources	
Ren, X	1996		143	J Electrochem Soc	
Shuklo, A	1995		87	J Power Sources	
Uschold, R	1984		1335	J Appl Polym Sci	
Zawodzinski, T	1993		199	Solid State Ionics	

L62 ANSWER 3 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2001:777682 HCAPLUS
DN 136:72239
TI Radiation-modified Nafion **membranes** for methanol fuel cells
AU Florjanczyk, Z.; Wielgus-Barry, E.; Poltarzewski, Z.
CS Faculty of Chemistry, Warsaw University of Technology, Warsaw, 00-664, Pol.
SO Solid State Ionics (**2001**), 145(1-4), 119-126
CODEN: SSIOD3; ISSN: 0167-2738
PB Elsevier Science B.V.
DT Journal
LA English
AB Nafion 117 **membranes** modified with vinylphosphonic acid and 2-acrylamido-2-methyl-1-propanesulfonic acid **polymers** have been obtained and characterized. The **membranes** were used in methanol fuel cells. Current-voltage profiles were obtained in a Globe Tech GT 60 station adapted to work in a system supplied with methanol. The measurements were **conducted** in a constant current or constant voltage mode with control of temperature of the cell, fuel and oxygen, and control of flow and pressure of methanol and oxygen. It was found that the insertion of vinylphosphonic acid into a Nafion **membrane**

increases the power d. of the fuel cell.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST Nafion **membrane** modified irradiated methanol fuel cell
IT **Fuel cell electrolytes**
Fuel cells
(irradiated modified Nafion **membranes** for methanol fuel cells)
IT 27119-07-9, Poly(2-Acrylamido-2-methyl-1-propanesulfonic acid)
27754-99-0, Poly(vinylphosphonic acid)
RL: MOA (Modifier or additive use); USES (Uses)
(Nafion **membranes** modified with; irradiated modified Nafion **membranes** for methanol fuel cells)
IT 66796-30-3, Nafion 117
RL: DEV (Device component use); USES (Uses)
(irradiated modified Nafion **membranes** for methanol fuel cells)
IT **27754-99-0**, Poly(vinylphosphonic acid)
RL: MOA (Modifier or additive use); USES (Uses)
(Nafion **membranes** modified with; irradiated modified Nafion **membranes** for methanol fuel cells)
RN 27754-99-0 HCAPLUS
CN Phosphonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Forsythe, J	2000	25	101	Prog Polym Sci	HCAPLUS
Guzman-Garcia, A	1992	22	204	J Appl Electrochem	HCAPLUS
Prater, K	1996	61	105	J Power Sources	HCAPLUS
Ren, X	1996	143	L12	J Electrochem Soc	HCAPLUS
Savadogo, O	1998	1	47	J New Mater Electroc	HCAPLUS
Shuklo, A	1995	55	87	J Power Sources	
Uschold, R	1984	29	1335	J Appl Polym Sci	HCAPLUS
Watkinks, D	1993		493	Fuel Cell System	
Wieczorek, W	1995	40	2327	Electrochim Acta	HCAPLUS
Wieczorek, W	1997	38	2057	Polymer	HCAPLUS
Zawodzinski, T	1993	140	1041	J Electrochem Soc	HCAPLUS
Zawodzinski, T	1993	60	199	Solid State Ionics	HCAPLUS

L62 ANSWER 4 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2001:713743 HCAPLUS
DN 135:259849
TI Method of fabrication of **membrane**/electrode composite for fuel cell
IN Charnock, Peter; Wilson, Brian
PA Victrex Manufacturing Limited, UK
SO PCT Int. Appl., 51 pp.
CODEN: PIXXD2
DT Patent
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001071835	A2	20010927	WO 2001-GB1244	20010321 <--
	WO 2001071835	A3	20020214		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRAI GB 2000-6878 A 20000322 <--
GB 2000-31211 A 20001221 <--

AB A method of manufacturing a **membrane**/electrode composite of a type which includes a catalyst material on a first material which comprises a first **conductive polymer** includes a step of contacting the first material comprising the first **conductive polymer** with a polar protic solvent (e.g. sulfuric acid, a sulfonic acid, hydrofluoric acid or phosphoric acid) and causing catalyst material to deposit on the first material. The composite may be used in an electrochem. device, for example a fuel cell.

IC ICM H01M0008-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST fuel cell **membrane** electrode composite

IT Polyamides, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(aromatic; method of fabrication of **membrane**/electrode composite for fuel cell)

IT Catalysts
(electrocatalysts; method of fabrication of **membrane**/electrode composite for fuel cell)

IT Ionomers
RL: TEM (Technical or engineered material use); USES (Uses)
(**fluoropolymers**; method of fabrication of **membrane**/electrode composite for fuel cell)

IT **Fluoropolymers**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(ionomers; method of fabrication of **membrane**/electrode composite for fuel cell)

IT **Conducting polymers**
Fuel cells
(method of fabrication of **membrane**/electrode composite for fuel cell)

IT Sulfonic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(method of fabrication of **membrane**/electrode composite for fuel cell)

IT Synthetic **polymeric** fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polybenzazole; method of fabrication of **membrane**/electrode composite for fuel cell)

IT Solvents
(protic; method of fabrication of **membrane**/electrode composite for fuel cell)

IT Plastics, uses
RL: TEM (Technical or engineered material use); USES (Uses)

(thermoplastics; method of fabrication of **membrane**/electrode composite for fuel cell)

IT Plastics, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(thermosetting, aromatic; method of fabrication of **membrane**/electrode composite for fuel cell)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(method of fabrication of **membrane**/electrode composite for fuel cell)

IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(method of fabrication of **membrane**/electrode composite for fuel cell)

IT 128324-23-2DP, 4,4'-Difluorobenzophenone-4,4'-dihydroxybiphenyl-4,4'-dihydroxybenzophenone **copolymer**, sulfonated 128324-24-3DP, 4,4'-Difluorobenzophenone-4,4'-dihydroxybiphenyl-4,4'-dihydroxydiphenylsulfone **copolymer**, sulfonated
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(method of fabrication of **membrane**/electrode composite for fuel cell)

IT 7664-38-2, Phosphoric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-93-9, Sulfuric acid, uses 9003-01-4 **26101-52-0**, Polyvinyl sulfonic acid **27754-99-0**, Polyvinyl phosphonic acid 50851-57-5, Polystyrene sulfonic acid 264624-35-3
RL: TEM (Technical or engineered material use); USES (Uses)
(method of fabrication of **membrane**/electrode composite for fuel cell)

IT **26101-52-0**, Polyvinyl sulfonic acid **27754-99-0**, Polyvinyl phosphonic acid
RL: TEM (Technical or engineered material use); USES (Uses)
(method of fabrication of **membrane**/electrode composite for fuel cell)

RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S

$H_2C{=}CH{-}SO_3H$

RN 27754-99-0 HCAPLUS
CN Phosphonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P

$H_2C{=}CH{-}PO_3H_2$

L62 ANSWER 5 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2001:472016 HCAPLUS
DN 135:62388
TI Solid **polymer** electrolyte having high-durability
IN Suzuki, Takahisa; Taniguchi, Takumi; Morimoto, Yu; Kawasumi, Masaya; Hasegawa, Naoki; Kamiya, Atsushi
PA Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan
SO Eur. Pat. Appl., 37 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1110992	A1	20010627	EP 2000-126079	20001129 <--
	EP 1110992	B1	20060802		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001223015	A2	20010817	JP 2000-352300	20001120 <--
	JP 3656244	B2	20050608		
	US 2001038937	A1	20011108	US 2000-725267	20001129 <--
	US 6607856	B2	20030819		
PRAI	JP 1999-337015	A	19991129 <--		
	JP 2000-352300	A	20001120 <--		

AB In solid **polymer** electrolyte having high-durability, comprising a **polymer** electrolyte material having a hydrocarbon part, a chelate group and an electrolyte group are introduced into the **polymer** electrolyte material. The chelate group contains a phosphonic acid group, nitrogen, both of nitrogen and a phosphonic acid group (one or more selected from the group consisting of alkylamino monophosphonic acid groups, alkylamino diphosphonic acid groups, dialkylamino monophosphonic acid groups, alkylalkylene diamine triphosphonic acid groups, and alkylimino phosphonic acid groups) or, both of nitrogen and a carboxylic acid group (one or more selected from the group consisting of alkylamino monocarboxylic acid groups, alkylamino dicarboxylic acid groups, dialkylamino monocarboxylic acid groups, alkylalkylene diamine tricarboxylic acid groups, and alkylimino carboxylic acid groups).
IC ICM C08J0005-22
ICS H01M0008-10; H01M0008-02; C08J0005-20
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 52
ST polyelectrolyte **membrane** fuel cell; ethylene styrene tetrafluoroethylene graft **copolymer** polyelectrolyte; chelating group polyelectrolyte
IT Polysulfones, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, phosphonated; solid **polymer** electrolyte having high-durability)
IT Polysulfones, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyether-, sulfonated; solid **polymer** electrolyte having high-durability)
IT Polyethers, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polysulfone-, phosphonated; solid **polymer** electrolyte having high-durability)

IT Polyethers, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polysulfone-, sulfonated; solid **polymer** electrolyte having high-durability)

IT **Fuel cells**
Membranes, nonbiological
Polyelectrolytes
(solid **polymer electrolyte** having high-durability)

IT 31694-16-3DP, PEEK, phosphonated 31694-16-3DP, PEEK, sulfonated 197895-58-2DP, Ethylene-styrene-tetrafluoroethylene graft **copolymer**, diethylphosphonated 197895-58-2DP, Ethylene-styrene-tetrafluoroethylene graft **copolymer**, sulfonated
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(solid **polymer** electrolyte having high-durability)

IT **27754-99-0**, Poly(vinylphosphonic acid)
RL: MOA (Modifier or additive use); USES (Uses)
(solid **polymer** electrolyte having high-durability)

IT **27754-99-0**, Poly(vinylphosphonic acid)
RL: MOA (Modifier or additive use); USES (Uses)
(solid **polymer** electrolyte having high-durability)

RN 27754-99-0 HCAPLUS
CN Phosphonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P

$H_2C{=}CH{-}PO_3H_2$

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1992	016	C-0948	PATENT ABSTRACTS OF	
Anon	1995	1995		PATENT ABSTRACTS OF	
Asahi Chem Ind Co Ltd	1995			JP 07024314 A	HCAPLUS
Chlorine Engineers Kk	1985			JP 60078645 A	HCAPLUS
Toagosei Chem Ind Co Lt	1992			JP 04056794 A	HCAPLUS

L62 ANSWER 6 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2001:435421 HCAPLUS
DN 135:21992
TI Fuel cells
IN Abe, Masao; Ohtani, Akira; Ishibashi, Kuniaki
PA Nitto Denko Corporation, Japan
SO PCT Int. Appl., 33 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI WO 2001043215 A1 20010614 WO 2000-JP8594 20001204 <--
W: CA, US
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR
CA 2393812 AA 20010614 CA 2000-2393812 20001204 <--
JP 2002203570 A2 20020719 JP 2000-368092 20001204 <--
EP 1253656 A1 20021030 EP 2000-979089 20001204 <--
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR
US 2003113611 A1 20030619 US 2002-149227 20021008 <--
PRAI JP 1999-352378 A 19991210 <--
JP 2000-323818 A 20001024 <--
WO 2000-JP8594 W 20001204 <--

AB The fuel cells have an electrolyte **membrane** between a cathode and an anodes, an oxidant gas supplied to the cathode, and a fuel gas supplied to the anode; where the cathode and/or anode have a catalyst layer of a **conducting** organic **polymer**, which can be oxidized and reduced.

IC H01M0004-90
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel cell electrode catalyst redoxable **conducting polymer**
IT **Fuel cell electrodes**
(catalysts containing redox-able **conducting polymers** for fuel cell electrodes)
IT Polyanilines
RL: CAT (Catalyst use); USES (Uses)
(catalysts containing redox-able **conducting polymers** for fuel cell electrodes)
IT 1308-04-9, Cobalt oxide (Co2O3) 1317-61-9, Iron oxide (Fe3O4), uses 1333-39-7D, Phenolsulfonic acid, novolak resin, reaction products with polyaniline 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 20667-12-3, Silver oxide 25013-01-8, Polypyridine 25233-30-1, Polyaniline **26101-52-0D**, Polyvinylsulfonic acid, reaction products with polyaniline 72776-77-3D, Phenylquinoline, **homopolymer**
RL: CAT (Catalyst use); USES (Uses)
(catalysts containing redox-able **conducting polymers** for fuel cell electrodes)
IT **26101-52-0D**, Polyvinylsulfonic acid, reaction products with polyaniline
RL: CAT (Catalyst use); USES (Uses)
(catalysts containing redox-able **conducting polymers** for fuel cell electrodes)
RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S

$H_2C{=}CH{-}SO_3H$

RETABLE
Referenced Author |Year | VOL | PG | Referenced Work | Referenced

(RAU)	(RPY)	(RVL)	(RPG)	(RWK)	File
Bridgestone Corporation				JP 6428556 A	
Bridgestone Corporation	1989			EP 300082 A2	HCAPLUS
Pentel Kabushiki Kaisha	1984			JP 5925181 A	
Pentel Kabushiki Kaisha	1985			JP 60180065 A	HCAPLUS
Pentel Kabushiki Kaisha	1987			JP 6276256 A	
Tdk Corporation	1985			JP 60180064 A	HCAPLUS
Yoshino, K	1986			JP 61124070 A	HCAPLUS

L62 ANSWER 7 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2000:260778 HCAPLUS
DN 132:294808
TI Composite solid **polymer** electrolyte **membranes**
IN Formato, Richard M.; Kovar, Robert F.; Osenar, Paul; Landrau, Nelson; Rubin, Leslie S.
PA Foster-Miller, Inc., USA
SO PCT Int. Appl., 95 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000022684	A2	20000420	WO 1999-US19476	19990826 <--
	WO 2000022684	A3	20000720		
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	WO 9910165	A1	19990304	WO 1998-US17898	19980828 <--
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6248469	B1	20010619	US 1999-261349	19990303 <--
	CA 2342237	AA	20000420	CA 1999-2342237	19990826 <--
	AU 2000023415	A5	20000501	AU 2000-23415	19990826 <--
	EP 1116292	A2	20010718	EP 1999-967058	19990826 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2003528420	T2	20030924	JP 2000-576501	19990826 <--
PRAI	WO 1998-US17898	W	19980828 <--		
	US 1999-261349	A	19990303 <--		
	US 1997-57233P	P	19970829 <--		
	WO 1998-US178	W	19980828 <--		
	WO 1999-US19476	W	19990826 <--		

AB The present invention relates to composite solid **polymer** electrolyte **membranes** (SPEMs) which include a porous **polymer** substrate (typically a liquid crystal **polymer**) interpenetrated with an ion-**conducting** material (typically a perfluorinated ionomer). SPEMs of the present invention are useful in

electrochem. applications, including fuel cells and electrodialysis.
IC ICM H01M
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 52
ST composite solid **polymer** electrolyte **membrane**; fuel cell **polymer** electrolyte **membrane**; electrodialysis **polymer** electrolyte **membrane**; liq crystal **polymer** interpenetrating network electrolyte; perfluorinated ionomer interpenetrating network electrolyte
IT Pervaporation
(apparatus; composite solid **polymer** electrolyte **membranes**)
IT Polyamides, uses
Polyketones
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(aromatic; composite solid **polymer** electrolyte **membranes**)
IT Dialyzers
Electrolytic cells
Interpenetrating **polymer** networks
Liquid crystals, **polymeric**
Primary batteries
(composite solid **polymer** electrolyte **membranes**)
IT Polybenzimidazoles
Polybenzothiazoles
Polybenzoxazoles
Polyimides, uses
Polyoxyphenylenes
Polyphenyls
Polysulfones, uses
Polythiophenylenes
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(composite solid **polymer** electrolyte **membranes**)
IT **Fuel cells**
(direct methanol or hydrogen; composite solid **polymer electrolyte membranes**)
IT Dialyzers
(electrodialyzers; composite solid **polymer** electrolyte **membranes**)
IT Polyimides, uses
Polyimides, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fluorine-containing; composite solid **polymer** electrolyte **membranes**)
IT Ionomers
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(**fluoropolymers**; composite solid **polymer** electrolyte **membranes**)
IT **Fluoropolymers**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(ionomers; composite solid **polymer** electrolyte **membranes**)
IT **Polymer** electrolytes
(**membrane**; composite solid **polymer** electrolyte **membranes**)

IT Polyimides, uses
Polyimides, uses
Polyketones
Polyketones
Polysulfones, uses
Polysulfones, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyether-; composite solid **polymer** electrolyte **membranes**)

IT **Fluoropolymers**, uses
Fluoropolymers, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyimide-; composite solid **polymer** electrolyte **membranes**)

IT Polyethers, uses
Polyethers, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyimide-; composite solid **polymer** electrolyte **membranes**)

IT Polyethers, uses
Polyethers, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyketone-; composite solid **polymer** electrolyte **membranes**)

IT Polyquinoxalines
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyphenylquinoxalines; composite solid **polymer** electrolyte **membranes**)

IT Polysulfones, uses
Polysulfones, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polysulfide-, aromatic; composite solid **polymer** electrolyte **membranes**)

IT Polysulfides
Polysulfides
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polysulfone-, aromatic; composite solid **polymer** electrolyte **membranes**)

IT Polyethers, uses
Polyethers, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polysulfone-; composite solid **polymer** electrolyte **membranes**)

IT **Membranes**, nonbiological
(solid **polymer** electrolyte; composite solid **polymer** electrolyte **membranes**)

IT Plastics, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(thermoplastics; composite solid **polymer** electrolyte **membranes**)

IT Plastics, uses

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(thermosetting; composite solid **polymer** electrolyte **membranes**)

IT 25667-42-9DP, sulfonated
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(Ultrason; composite solid **polymer** electrolyte **membranes**)

IT 25135-51-7DP, Udel, sulfonated 25212-74-2DP, PPS, sulfonated 63496-24-2P, Nafion EW1100 154281-38-6DP, Radel R, sulfonated 220998-11-8P, 4,4'-(Hexafluoroisopropylidene)bis(phthalic anhydride-m-Phenylenediamine-sodium 2,4-diaminobenzenesulfonate **copolymer**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(composite solid **polymer** electrolyte **membranes**)

IT 88-63-1P, 2,4-Diaminobenzenesulfonic acid 3177-22-8P, Sodium 2,4-diaminobenzenesulfonate
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(composite solid **polymer** electrolyte **membranes**)

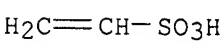
IT 9003-01-4, Polyacrylic acid 24938-64-5 24938-67-8, Poly[oxy(2,6-dimethyl-1,4-phenylene)] 24938-68-9, 2,6-Diphenylphenol **homopolymer**, sru 25035-37-4, p-Phenylenediamine-terephthalic acid **copolymer** 25134-01-4, 2,6-Dimethylphenol **homopolymer 26101-52-0**, Polyvinyl sulfonic acid 26353-84-4, 2,6-Diphenylphenol **homopolymer 27754-99-0**, Polyvinyl phosphonic acid 50851-57-5, Polystyrene sulfonic acid 264624-35-3, Trifluorostyrenesulfonic acid **homopolymer**
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(composite solid **polymer** electrolyte **membranes**)

IT **26101-52-0**, Polyvinyl sulfonic acid **27754-99-0**, Polyvinyl phosphonic acid
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(composite solid **polymer** electrolyte **membranes**)

RN 26101-52-0 HCAPLUS
CN Ethenesulfonic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1184-84-5
CMF C2 H4 O3 S



RN 27754-99-0 HCAPLUS
CN Phosphonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1746-03-8
CMF C2 H5 O3 P

$H_2C{=}CH{-}PO_3H_2$

=> => d bib abs hitstr retable tot

These last 7 references contain structures which are much broader -

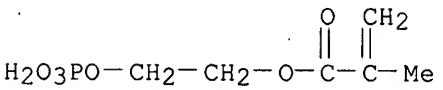
L65 ANSWER 1 OF 7 HCAPLUS COPYRIGHT
AN 2004:32956 HCAPLUS
DN 140:96868
TI Phosphate and/or sulfonate group c
(composite) membrane and fuel cel
IN Rikukawa, Masahiro; Kanzaki, Yoshi
PA Uni Chemical K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 30 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE		
PI	JP 2004014232	A2	20040115	JP 2002-164577	20020605 <--
PRAI	JP 2002-164577		20020605 <--		

AB The electrolyte membrane has a uniform composition comprising: a -PO4 group containing polymer by polymerizing a -PO4 group containing unsatd. monomer having ≥1 -PO4 group inside the mol. and ≥1 unsatd. ethylene bond; a -SO3 and -PO4 group containing copolymer by copolymg. the PO4 group containing unsatd. monomer and a -SO3 group containing unsatd. monomer having ≥1 -SO3 group inside the mol. and ≥1 unsatd. ethylene bond; ≥1 -SO3 group containing polymer by polymerizing a -SO3 group containing unsatd. monomer; and a polyamide resin. The electrolyte composite **membrane** having **proton conductivity** and is made of the above uniform composition and a reinforced sheet.

IT **24599-21-1 51131-63-6 163549-93-7**
RL: DEV (Device component use); USES (Uses)
(polymer electrolyte membranes containing phosphate and/or sulfonate groups for fuel cells)

RN 24599-21-1 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2-(phosphonooxy)ethyl ester (9CI) (CA INDEX NAME)

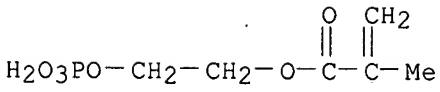


$H_2O_3PO{-}CH_2{-}CH_2{-}O{-}C(=O){-}C(=CH_2){-}Me$

RN 51131-63-6 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2-(phosphonooxy)ethyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

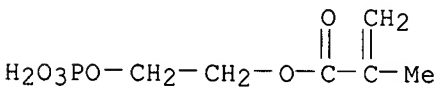
CRN 24599-21-1
CMF C6 H11 O6 P



RN 163549-93-7 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, polymer with 2-(phosphonooxy)ethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

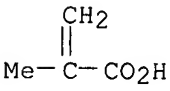
CM 1

CRN 24599-21-1
CMF C6 H11 O6 P



CM 2

CRN 79-41-4
CMF C4 H6 O2



L65 ANSWER 2 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:719543 HCAPLUS
DN 139:248013
TI Manufacture of proton-conducting fuel cell electrolyte membrane having reduced methanol permeability
IN Kiefer, Joachim; Uensal, Oemer; Calundann, Gordon; Crivello, James
PA Celanese Ventures GmbH, Germany
SO PCT Int. Appl., 58 pp.
CODEN: PIXXD2
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003074597	A1	20030912	WO 2003-EP2397	20030304 <--
	W: BR, CA, CN, JP, KR, MX, US				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
	DE 10209685	A1	20030918	DE 2002-10209685	20020306 <--
	DE 10210499	A1	20030925	DE 2002-10210499	20020311 <--
	CA 2478530	AA	20030912	CA 2003-2478530	20030304 <--
	EP 1483316	A1	20041208	EP 2003-743390	20030304 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
	US 2005118477	A1	20050602	US 2003-506387	20030304 <--
	JP 2005519428	T2	20050630	JP 2003-573059	20030304 <--

CN 1639239 A 20050713 CN 2003-805300 20030304 <--
PRAI DE 2002-10209685 A 20020306 <--
DE 2002-10210499 A 20020311 <--
WO 2003-EP2397 W 20030304

AB A title membrane was manufactured by (A) swelling a polymer film with a liquid comprising vinylsulfonic acid and (B) polymerization of the vinylsulfonic acid present in the liquid used in step (A). For example, heating aqueous solution containing vinylsulfonic acid (obtained by acidification of Na vinylsulfonate with acidic ion exchanger) and vinylphosphonic acid for 1 h at 70°, adding CN-120 (epoxy acrylate) and Irgacure 184, heating the solution for 30 min at 70°, immersing a polybenzimidazole film in the mixture and heating for 3 h at 80°, placing the resulting film between transparent polypropylene (PP) films, irradiating both sides of the laminate and separating PP films gave a title membrane. The typical weight gain of the membrane was 350%.

IT **596130-68-6P**, CN 120-Styrenesulfonic acid-Vinylphosphonic acid copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(membrane; manufacture of vinylsulfonic acid copolymer proton-conducting fuel cell electrolyte membrane)

RN 596130-68-6 HCAPLUS

CN Phosphonic acid, ethenyl-, polymer with CN 120 and ethenylbenzenesulfonic acid (9CI) (CA INDEX NAME)

CM 1

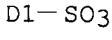
CRN 163206-65-3
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 26914-43-2
CMF C8 H8 O3 S
CCI IDS

D1—CH=CH$_2$



D1—SO$_3$H

CM 3

CRN 1746-03-8
CMF C2 H5 O3 P

$H_2C{=}CH{-}PO_3H_2$

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1978	002	C-026	PATENT ABSTRACTS OF	
Hans-Joerg, J	2000			US 6096369 A	HCAPLUS
Huels Chemische Werke A	1999			EP 0893165 A	HCAPLUS
Klein, E	1980			US 4187333 A	HCAPLUS
Nakao, S	2000			WO 0054351 A	HCAPLUS
Nakao, S	2000			EP 1202365	HCAPLUS
Toyo Soda Mfg Co Ltd	1978			JP 53097988 A	HCAPLUS

L65 ANSWER 3 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:719542 HCAPLUS
DN 139:248012
TI Manufacture of **proton-conducting** electrolyte **membrane** for use at high temperatures and in fuel cells
IN Uensal, Oemer; Kiefer, Joachim
PA Celanese Ventures GmbH, Germany
SO PCT Int. Appl., 59 pp.
CODEN: PIXXD2
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003074596	A1	20030912	WO 2003-EP2399	20030304 <--
	W: BR, CA, CN, JP, KR, MX, US				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
	DE 10209419	A1	20030925	DE 2002-10209419	20020305 <--
	CA 2477864	AA	20030912	CA 2003-2477864	20030304 <--
	EP 1483314	A1	20041208	EP 2003-711950	20030304 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
	US 2005084727	A1	20050421	US 2003-506880	20030304 <--
	CN 1649944	A	20050803	CN 2003-810121	20030304 <--
	JP 2005527073	T2	20050908	JP 2003-573058	20030304 <--
PRAI	DE 2002-10209419	A	20020305 <--		
	WO 2003-EP2399	W	20030304		

AB A title membrane is manufactured by (A) swelling a polymer film with a liquid containing a vinylphosphonic acid, and (B) polymerizing the vinylphosphonic acid present in the liquid introduced in step (A). For example, soaking a polybenzimidazole film for 1.5-2.5 h at 80° in a solution containing 1 part H2O and 10 parts 97% vinylphosphonic acid, soaking the swollen film in a solution containing 10 parts vinylphosphonic acid and 1 part aqueous solution containing 0.1% 2,2'-azobis(isobutyramidine)·2HCl and heating the film for 1 h at 80° gave a title membrane having conductivity 15.3 mS/cm (160°).
IT **161035-26-3P**, N,N'-Methylenebisacrylamide-Vinylphosphonic acid copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(crosslinked, **membrane**; manufacture of **proton-**

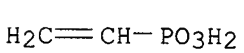
conducting electrolyte **membrane** for use at high temps. and in fuel cells)

RN 161035-26-3 HCAPLUS

CN Phosphonic acid, ethenyl-, polymer with N,N'-methylenebis[2-propenamide] (9CI) (CA INDEX NAME)

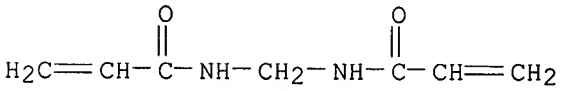
CM 1

CRN 1746-03-8
CMF C2 H5 O3 P



CM 2

CRN 110-26-9
CMF C7 H10 N2 O2



IT **596044-62-1P**, CN 120-Vinylphosphonic acid copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**membrane**; manufacture of **proton-conducting** electrolyte **membrane** for use at high temps. and in fuel cells)

RN 596044-62-1 HCAPLUS

CN Phosphonic acid, ethenyl-, polymer with CN 120 (9CI) (CA INDEX NAME)

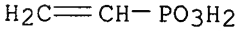
CM 1

CRN 163206-65-3
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 1746-03-8
CMF C2 H5 O3 P



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Andreola, C	1997			US 5643968 A	HCAPLUS
Yu, M	2001			US 2001038937 A1	HCAPLUS

L65 ANSWER 4 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:56659 HCAPLUS
DN 138:124980
TI **Proton-conductive membranes** or films and their manufacture for proton exchange membranes in fuel cells
IN Fujita, Shigeru; Abe, Masao
PA Nitto Denko Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2003022823	A2	20030124	JP 2001-207547	20010709 <--
PRAI JP 2001-207547		20010709 <--		

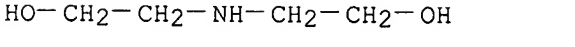
AB The **proton-conductive membranes** are manufactured by (1) polymerizing (A) monofunctional monomers having phosphoric, phosphonic, or phosphinic groups in side chains with (B) monofunctional monomers having amine salts of the above groups in pores of porous membranes (e.g., ultrahigh-mol.-weight polyolefins, fluoropolymers) so that the resulting polymers are supported in the pores or (2) polymerizing the above A monomers in the pores and partially converting the side chain groups of the resulting polymers to amine salts. The films are manufactured by closing at least a part of residual hollow pores of the membranes. The polymers having partial amine salts have high adhesion to the porous **membranes**, and the **proton-conductive membranes** and films have high durability and mech. strength and reduce cost for fuel cell systems.

IT **490028-34-7P 490028-36-9P 490028-37-0P**
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**proton-conductive membranes** or films using partial amine salt-bearing polymers in membrane pores and their manufacture for proton exchange membranes in fuel cells)

RN 490028-34-7 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 4,6-dihydroxy-4,6-dioxido-3,5,7-trioxa-4,6-diphosphanonane-1,9-diyl ester, polymer with 2-methoxyethyl 2-propenoate and 2-(phosphonooxy)ethyl 2-methyl-2-propenoate, compd. with 2,2'-iminobis[ethanol] (9CI) (CA INDEX NAME)

CM 1

CRN 111-42-2
CMF C4 H11 N O2

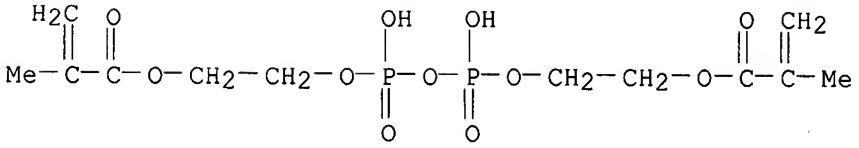


CM 2

CRN 490028-33-6
CMF (C12 H20 O11 P2 . C6 H11 O6 P . C6 H10 O3)x
CCI PMS

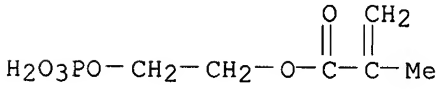
CM 3

CRN 61988-50-9
CMF C12 H20 O11 P2



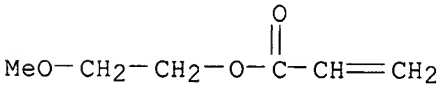
CM 4

CRN 24599-21-1
CMF C6 H11 O6 P



CM 5

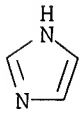
CRN 3121-61-7
CMF C6 H10 O3



RN 490028-36-9 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 4,6-dihydroxy-4,6-dioxido-3,5,7-trioxa-4,6-diphosphanonane-1,9-diyl ester, polymer with 2-(phosphonooxy)ethyl 2-methyl-2-propenoate, compd. with 1H-imidazole (9CI) (CA INDEX NAME)

CM 1

CRN 288-32-4
CMF C3 H4 N2



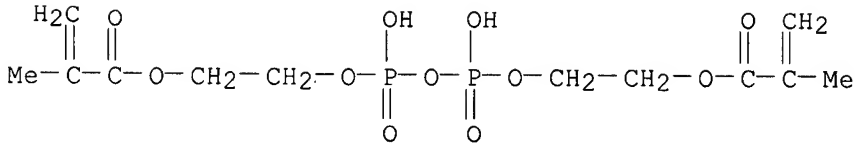
CM 2

CRN 490028-35-8
CMF (C12 H20 O11 P2 . C6 H11 O6 P)x
CCI PMS

CM 3

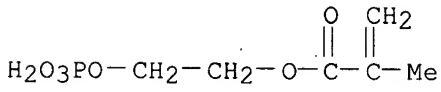
CRN 61988-50-9

CMF C12 H20 O11 P2



CM 4

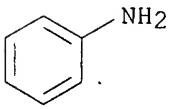
CRN 24599-21-1
CMF C6 H11 O6 P



RN 490028-37-0 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 4,6-dihydroxy-4,6-dioxido-3,5,7-trioxa-4,6-diphosphanonane-1,9-diyl ester, polymer with 2-(phosphonooxy)ethyl 2-methyl-2-propenoate, compd. with benzenamine (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N

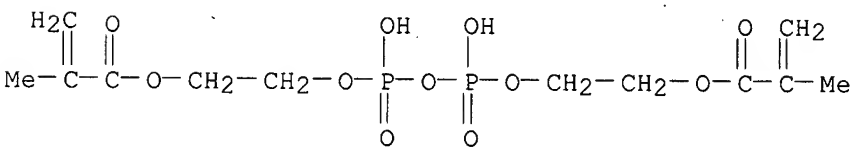


CM 2

CRN 490028-35-8
CMF (C12 H20 O11 P2 . C6 H11 O6 P)x
CCI PMS

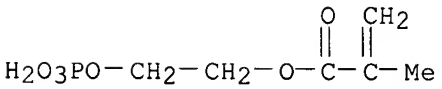
CM 3

CRN 61988-50-9
CMF C12 H20 O11 P2



CM 4

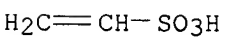
CRN 24599-21-1
CMF C6 H11 O6 P



L65 ANSWER 5 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2002:781958, HCAPLUS
DN 138:224060
TI A Pore-Filling Electrolyte Membrane-Electrode Integrated System for a Direct Methanol Fuel Cell Application
AU Yamaguchi, Takeo; Ibe, Masaya; Nair, Balagopal N.; Nakao, Shin-ichi
CS Department of Chemical System Engineering, The University of Tokyo, Bunkyo-ku, Tokyo, 113-8656, Japan
SO Journal of the Electrochemical Society (**2002**), 149(11), A1448-A1453
CODEN: JESOAN; ISSN: 0013-4651
PB Electrochemical Society
DT Journal
LA English
AB A novel electrolyte membrane is needed to develop a high performance direct methanol fuel cell. This membrane should be durable up to 130° to improve the catalytic reaction and MeOH crossover should be reduced. A pore-filled polyelectrolyte membrane was designed where the polyelectrolyte is filled into the pores of a porous substrate. This creates an integrated system with a membrane and a catalyst layer. The porous substrate was completely inert to aqueous MeOH solution and was durable at high temperature The substrate matrix could suppress membrane swelling to reduce MeOH crossover and had mech. strength at high temps. A radical polymerization technique was used to fabricate the pore-filling membrane. A porous SiO2 sol-gel thin-base membrane on a C electrode was used as a membrane-electrode integrated system. The substrate pores were filled with an acrylic acid-vinylsulfonic acid copolymer network. The **membranes** showed high **proton conductivity**, thermal stability, and low MeOH permeation.
IT **25053-28-5**, Acrylic acid-vinylsulfonic acid copolymer
501005-91-0
RL: DEV (Device component use); USES (Uses)
(electrolyte; polymer electrolyte-filled porous silica membrane integrated with electrode for direct methanol fuel cells)
RN 25053-28-5 HCAPLUS
CN 2-Propenoic acid, polymer with ethenesulfonic acid (9CI) (CA INDEX NAME)

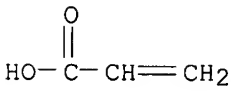
CM 1

CRN 1184-84-5
CMF C2 H4 O3 S



CM 2

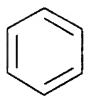
CRN 79-10-7
CMF C3 H4 O2

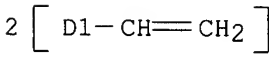


RN 501005-91-0 HCAPLUS
CN 2-Propenoic acid, polymer with diethenylbenzene and ethenesulfonic acid (9CI) (CA INDEX NAME)

CM 1

CRN 1321-74-0
CMF C10 H10
CCI IDS





CM 2

CRN 1184-84-5
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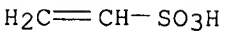
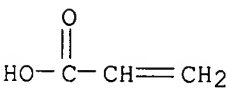


CM 3

CRN 79-10-7
CMF C3 H4 O2



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Antonucci, P	1999	125	431	Solid State Ionics	HCAPLUS

Depre, L	2000	45	1377	Electrochim Acta	HCAPLUS
Honma, I	1999	120	255	Solid State Ionics	HCAPLUS
Jou, J	1999	162	269	J Membr Sci	HCAPLUS
Kai, T	2000	39	3284	Ind Eng Chem Res	HCAPLUS
Lehtinen, T	1998	43	1881	Electrochim Acta	HCAPLUS
Mika, A	1997	135	81	J Membr Sci	HCAPLUS
Ulbricht, M	1997	136	25	J Membr Sci	HCAPLUS
Wainright, J	1995	142	L121	J Electrochem Soc	HCAPLUS
Wang, H	1999	154	221	J Membr Sci	HCAPLUS
Wenzel, A	2000	179	69	J Membr Sci	HCAPLUS
Yamaguchi, T	1996	42	892	AIChE J	HCAPLUS
Yamaguchi, T	1992	31	1914	Ind Eng Chem Res	HCAPLUS
Yamaguchi, T	1993	32	848	Ind Eng Chem Res	HCAPLUS
Yamaguchi, T	1994	95	39	J Membr Sci	HCAPLUS
Yamaguchi, T				J Membr Sci, In pres	
Yamaguchi, T				J Membr Sci, Submitt	
Yamaguchi, T	1991	24	5522	Macromolecules	HCAPLUS

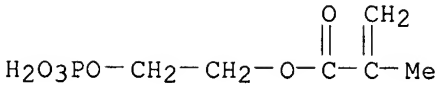
L65 ANSWER 6 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2002:216370 HCAPLUS
DN 136:265786
TI **Proton-conducting membrane** or film, its manufacture, and fuel cell using it
IN Fujita, Shigeru; Abe, Masao
PA Nitto Denko Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2002083514	A2	20020322	JP 2000-275015	20000906 <--
PRAI JP 2000-275015		20000906 <--		

AB The **proton-conducting membrane** comprises a porous membrane filled with a polymer having a phosphate-, phosphonate-, or phosphinate group at side chain in pores. A proton-conducting film consists of the above membrane, where a part of voids in the pores are closed. The membrane is manufactured by impregnating a monomer having a phosphate-, phosphonate-, or phosphinate side chain in a porous membrane and then polymerizing in the pores. The film is manufactured from the membrane by closing the pores. Also claimed is a fuel cell equipped with the membrane or the film as a proton-exchange membrane. The membrane and the film have high durability and strength.
IT **51131-63-6P**, Light Ester P 1M homopolymer **103719-23-9P**, Butyl acrylate-Light Ester P 1M copolymer
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(**proton-conducting membrane** or film containing polymer having phosphate-, phosphonate-, or phosphinate side chain for fuel cell)
RN 51131-63-6 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2-(phosphonooxy)ethyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

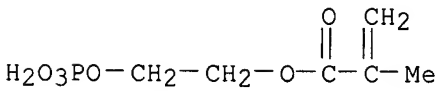
CRN 24599-21-1
CMF C6 H11 O6 P



RN 103719-23-9 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2-(phosphonooxy)ethyl ester, polymer with butyl 2-propenoate (9CI) (CA INDEX NAME)

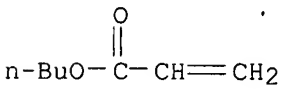
CM 1

CRN 24599-21-1
CMF C6 H11 O6 P



CM 2

CRN 141-32-2
CMF C7 H12 O2



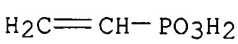
L65 ANSWER 7 OF 7 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2000:655422 HCAPLUS
DN 134:208563
TI **Proton conducting membranes**
AU Florjanczyk, Zbigniew; Bzducha, Wojciech; Wielgus-Barry, Edyta
CS Faculty of Chemistry, Warsaw University of Technology, Pol.
SO Zeszyty Naukowe Politechniki Slaskiej, Chemia (**1999**), 140, 235-238
CODEN: ZNSCAM; ISSN: 0372-9494
PB Wydawnictwo Politechniki Slaskiej
DT Journal
LA English
AB Composite membranes containing poly(vinylidene fluoride) (PVDF), polybenzimidazole (PBI), and Nafion 117 were fabricated by solution casting using H3PO4 and vinylphosphonic acid (VPA) copolymers and terpolymers as proton donors. The vinylphosphonic acid copolymers and terpolymers were prepared with N,N'-methylenediacrylamide and acrylamide. Membranes comprising vinylphosphonic acid copolymers and PVDF and membranes based on Nafion 117 show good mech. properties and ionic conductivity of the order of 10-3 S/cm.
IT **161035-26-3**, N,N'-Methylenebisacrylamide-vinylphosphonic acid copolymer
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(composite membrane; preparation of vinylphosphonic acid copolymers and fabrication and performance of **proton conducting** composite **membranes**)

RN 161035-26-3 HCAPLUS
CN Phosphonic acid, ethenyl-, polymer with N,N'-methylenebis[2-propenamide] (9CI) (CA INDEX NAME)

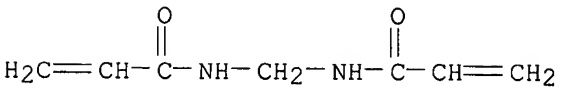
CM 1

CRN 1746-03-8
CMF C2 H5 O3 P



CM 2

CRN 110-26-9
CMF C7 H10 N2 O2



=> d his

(FILE 'HOME' ENTERED AT 16:01:27 ON 06 DEC 2006)
SET COST OFF

FILE 'REGISTRY' ENTERED AT 16:01:33 ON 06 DEC 2006
L1 STR
L2 50 S L1

FILE 'HCAPLUS' ENTERED AT 16:02:47 ON 06 DEC 2006
L3 2 S US20050244695/PN OR (US2005-523373# OR WO2003-EP8462 OR DE200
L4 4634 S PROTON?(L)CONDUCT?(L)?MEMBRAN?
L5 2333 S L4 AND ?POLYM?
L6 2117 S L4 AND POLYM?/SC,SX,CW,CT,BI
L7 2363 S L5,L6

FILE 'REGISTRY' ENTERED AT 16:05:13 ON 06 DEC 2006
L8 SCR 1812 OR 1758
L9 STR
L10 50 S L9 AND L8 SAM
L11 180184 S L8 AND L9 FUL
L12 STR L1
L13 STR L12
L14 50 S L12 SAM SUB=L11
L15 109126 S L12 FUL SUB=L11
L16 66420 S L13 FUL SUB=L11

FILE 'HCAPLUS' ENTERED AT 16:08:04 ON 06 DEC 2006
L17 60343 S L16
L18 75669 S L15

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L19          200 S L7 AND L17,L18
L20          232 S L4 AND L17,L18
L21          232 S L19,L20
L22          122 S L21 AND PROTON?(2A)CONDUCT?(2A)?MEMBRAN?
L23          110 S L21 NOT L22
L24           14 S L22 AND PY<=2002 NOT P/DT
L25           36 S L23 AND PY<=2002 NOT P/DT
L26           36 S L22 AND (PD<=20020802 OR PRD<=20020802 OR AD<=20020802)
L27           49 S L23 AND (PD<=20020802 OR PRD<=20020802 OR AD<=20020802)
L28           85 S L24-L27
                 SEL RN L3

     FILE 'REGISTRY' ENTERED AT 16:11:56 ON 06 DEC 2006
L29           27 S E1-E27
L30            0 S L29 AND L11

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                 E FUEL CELL/CT
L31       19907 S E3 OR E4+OLD,NT OR E5+OLD,NT OR E6+OLD,NT OR E7 OR E8 OR E9+O
L32        2384 S E24
L33       42398 S E13-E32
                 E E13+ALL
L34       48788 S E6+OLD,NT
                 E E23+ALL
L35       23596 S E8+OLD
L36           44 S L28 AND L31-L35
                 SEL HIT RN

     FILE 'REGISTRY' ENTERED AT 16:16:39 ON 06 DEC 2006
L37           60 S E1-E60
                 SEL RN 17 32 34 51 53 54 56 59 60
L38            9 S E61-E69
                 SEL RN L37 15 16 18 21-24 28 31 35 37 44 55 57
L39           14 S E70-E83

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L40         2110 S L38
L41          790 S L40 AND  PY<=2002 NOT P/DT
L42         1776 S L40 AND (PD<=20020802 OR PRD<=20020802 OR AD<=20020802)
L43         1776 S L41,L42
L44           15 S L43 AND L7
L45           13 S L43 AND PROTON?(2A)CONDUCT?(2A)?MEMBRAN?
L46           26 S L43 AND L31-L35
L47           13 S L44,L45 AND L46
L48           15 S L44,L45,L47
L49           13 S L46 NOT L48
L50            2 S L49 AND PROTON? AND CONDUCT?
L51            8 S L49 AND MEMBRAN?
L52           10 S L49 AND ?POLYM?
L53            9 S L52 AND L50,L51
L54            9 S L50,L53
L55            1 S L51,L52 NOT L54
L56           24 S L54,L48
L57           17 S L56 AND PROTON?
L58           23 S L56 AND CONDUCT?
L59           23 S L56 AND ?MEMBRAN?
L60           24 S L56 AND ?POLYM?
L61           17 S L57 AND L58,L59
L62            7 S L58,L59 NOT L61
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     FILE 'HCAPLUS' ENTERED AT 16:28:06 ON 06 DEC 2006
L63          524 S L39
L64           15 S L63 AND PROTON?(2A)CONDUCT?(2A)?MEMBRAN?
L65            7 S L64 AND (PD<=20020802 OR PRD<=20020802 OR AD<=20020802)

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